

# Communications Technology 11 and 12

*Guide*

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## Communications Technology 11 and 12

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# Communications Technology 11 and Communications Technology 12

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# Introduction

## Background

The Department of Education has made a commitment to provide broad-based technology education in the public school system to meet the needs of all students.

The International Technology Education Association states that technological literacy enables people to develop knowledge and abilities about human innovation in action. As technological needs continually change globally, all citizens need to be technologically literate due to the need for them to be active participants in the decision-making process related to all aspects of society.

*Standards for Technological Literacy: Content for the Study of Technology* defines what students should know and be able to do in order to be technologically literate. Communications Technology 11 and Communications Technology 12 was developed using those standards along with the *Foundation for the Atlantic Canada Technology Education Curriculum*.

Technology has created a world of constant change. Students who study broad-based technology become comfortable with change and solving real-world problems. They become objective about the use of technology.

Not only do students need to learn about technology, they need to use technology by way of carrying out activities that identify technological problems and design and construct solutions to those problems. Students also need to experience technological processes to understand its breadth and depth as it relates to all career choices.

## Rationale

Communications Technology 11 and Communications Technology 12 is a course that involves using a hands-on approach to electronic, print, and web communication concepts for all grade 11 and 12 students. It provides all students with hands-on activities and introduces them to a broad spectrum of technological concepts, both in traditional media and new media. By the end of either course, students are able to use a range of technological tools, processes, and applications, integrate communications technology with other academic disciplines, design and create communication materials that solve technological problems, and explain the consequences of technology and how it affects society.

The essential skills of employees have changed. Roles and responsibilities of occupations and professions change significantly over the progression of one's career. Technological communications and problem-solving skills have become increasingly important, as are teamwork and a pragmatic approach to technology. Literacy and mathematics are essential skills that are integrated into

communications technology. Students will have the opportunity to work independently and collaboratively, and will develop skills to adapt to rapid and continuous change, not only as it relates to technology, but as it relates to society.

## The Nature of Communications Technology 11 and Communications Technology 12

Communications technology is designed for all students at the grade 11 and 12 levels. Since the technology education facilities and resources vary throughout the province, the course is designed to offer some selection to schools as to the modules of study.

There are **eight** modules in this document. Module 1 (Fundamentals of Communications Technology) and Module 2 (Photography) are mandatory at both the grade 11 level and the grade 12 level. The outcomes in module one are designed to be integrated throughout the other modules that comprise the course and may be addressed more than once throughout the teaching and learning process. Each of the other modules are designed to be 23–27 hours of learning time. The school will choose three other modules to deliver to complete the full-credit course in an activity-based environment. Schools that can address all outcomes in more than three other modules are welcome to do so.

It should be noted that the term “module” is intended as a broad-based approach to curriculum design and delivery as it applies to a unit of study. This is not to be confused with a self-directed proprietary product known as modular learning.

*Modules for Communications Technology 11 and Communications Technology 12:*

1. Fundamentals of Communications Technology (threading outcomes)
2. Photography
3. Technical Design
4. Graphic Design
5. Web Publishing
6. Animation
7. Broadcasting
8. Video Production

Teachers are encouraged to create a fully integrated course where each of the four modules taught are in some way interconnected while addressing the threading Fundamentals of Communications outcomes.

The course design can be graphically represented as follows:

Fundamentals Communications Technology	Photography
	Module choice 1
	Module choice 2
	Module choice 3

## How to Offer This Course

Students are to complete four hands-on modules of study at the grade 11 level for a full-credit and four hands-on modules of study at the grade 12 level for a full credit. Schools must offer the Photography Module at the grade 11 level and at the grade 12 level keeping in mind the more advanced specific curriculum outcomes for grade 12. Schools that offer only one communications technology course must offer the Photography module. Three other modules must be offered based on facilities and resources available.

## Suggested Learning Environments

Students need access to a multiactivity, communications technology lab, or innovations technology environment that is outfitted with a variety of communications technology equipment. Students also need access to computer technology and software appropriate for digitizing and editing photographs, completing design work, drafting, web publishing, and broadcasting.

## Suggested Equipment

Communications Technology is **not** a computer course, but rather a course in which computers play a part in solving problems related to design. It is important to note that the use of the computer for this course is not to be confused with “business related” applications or data processing, but rather for design and media engineering to support digital photography and other communications processes. The space in which this course is taught needs to be flexible and open in order to allow for a variety of activities to take place in addition to computing, such as photography and/or video studio set up, screen printing (which will also require access to a large sink, sign printing, etc.).

Teachers have found these items to be useful in delivering Communications Technology 11 and Communications Technology 12:

- Photographic equipment
- Video equipment
- Printing equipment
- Screen printing equipment (including sink area)
- Design software
- Video, audio, and graphic editing software
- Broadcasting equipment

## Course Designation

Communications Technology 11 and Communications Technology 12 are full-credit academic courses and are both eligible technology credits to meet graduation requirements. Communications Technology 11 and Communications Technology 12 are recommended for all students of all learning levels. Communications Technology 11 is not a prerequisite for Communications Technology 12. It is recommended that Communications Technology classes not exceed 24 students.

## Essential Graduation Learnings and Communications Technology 11 and Communications Technology 12

The Atlantic provinces have collaborated to identify the knowledge, skills, and attitudes that they consider to be essential for students graduating from high school. Those six essential graduation learnings (EGLs) are: aesthetic expression, citizenship, communication, personal development, problem solving, and technological competence.

Communications Technology 11 and Communications Technology 12 will help students work toward attaining these essential graduation learnings through the following examples:

### **Aesthetic Expression**

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*Graduates will be able to respond with critical awareness to various forms of the arts and be able to express themselves through the arts.*

At the end of Communications Technology 11 and Communications Technology 12, students will be expected to

- analyse communications tools both past and present in a manner that is both practical and theoretical
- identify the elements of good design
- creatively express ideas through various forms of communication including writing, drawing, technical drafting, screen arts, and multimedia

## Citizenship

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*Graduates will be able to assess social, cultural, economic, and environmental interdependence in a local and global context.*

At the end of Communications Technology 11 and Communications Technology 12, students will be expected to

- identify and respond to consequences of technology and technological solutions to problems
- create design solutions to technological problems that consider the ecological footprint of that design
- explore the historical consequences of technological development
- identify life cycle analysis of communications technology tools and equipment

## Communication

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*Graduates will be able to use the listening, viewing, speaking, reading, and writing modes of language(s) and mathematical and scientific concepts and symbols, to think, learn, and communicate effectively.*

At the end of Communications Technology 11 and Communications Technology 12, students will be expected to

- engage in comprehensive research and evaluation using a variety of reporting and representing methods as part of the problem-solving process
- prepare a professional portfolio that includes reflections and design work throughout the process of solving problems
- manipulate tools and materials to communicate ideas effectively and accurately
- express thoughts and feelings about product design through effective teamwork

## Personal Development

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*Graduates will be able to continue to learn and to pursue an active, healthy lifestyle.*

At the end of Communications Technology 11 and Communications Technology 12, students will be expected to

- engage in lifelong learning opportunities whereby students solve real world problems using a variety of tools and processes
- demonstrate technological awareness as it relates to real-life decision making and the effects of technology on their life and community
- adapt to emerging technology and adapt technology to meet the needs of humans
- develop an understanding of careers in the field of communications technology

## **Problem Solving**

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*Graduates will be able to use the strategies and processes needed to solve a wide variety of problems, including those requiring language, and mathematical, and scientific concepts.*

At the end of Communications Technology 11 and Communications Technology 12, students will be expected to

- engage in designing solutions to a variety of real-world problems using a diverse set of communications tools and processes
- construct and evaluate design solutions using the problem-solving model and critical-thinking skills
- adapt to a variety of situations involving operating, trouble-shooting, and managing communications systems

## **Technological Competence**

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*Graduates will be able to use a variety of technologies, demonstrate an understanding of technological applications, and apply appropriate technologies for solving problems.*

At the end of Communications Technology 11 and Communications Technology 12, students will be expected to

- demonstrate basic technical abilities using communications technology tools and machines
- use various technological tools and processes to solve design problems
- demonstrate an understanding of communications technology systems and how to apply them to real-world design
- define and explain communications technology

# Specific Curriculum Outcomes





# Specific Curriculum Outcomes

## Module 1: Fundamentals of Communications Technology (mandatory threading outcomes)

Grade 11 students will be expected to

- 1.1 demonstrate an understanding of the history of communication
- 1.2 investigate their strengths related to career options in communications technology
- 1.3 generate a professional portfolio representing a collection of work completed throughout the course using the design process
- 1.4 determine and create solutions to design problems that can persuade or entertain an audience using a variety of electronic communications tools
- 1.5 demonstrate an understanding of the social and environmental impacts of communications technology
- 1.6 demonstrate an understanding of life-cycle analysis of modern communications equipment and processes
- 1.7 demonstrate safe practices when using communications technology tools and equipment

Grade 12 students will be expected to

- 1.8 investigate modern and future forms of communication and predict futuristic career options in communications technology
- 1.9 generate a digital professional portfolio representing a collection of advanced work completed throughout the course using the design process
- 1.10 design, create, and transport solutions to design problems that can entertain a variety of target audiences using a variety of electronic communications tools
- 1.11 examine and analyse solutions to communications technology problems
- 1.12 create a design improvement to the life-cycle analysis of an electronic communication device
- 1.13 establish a safe practice policy for one or more communication technology processes within the classroom laboratory

## Module 2: Digital Photography (mandatory module)

Grade 11 students will be expected to

- 2.1 demonstrate an understanding of the basic operation and care of a digital camera
- 2.2 practice various photographic techniques and photographic composition using a single lens reflex camera and tripod
- 2.3 explore various scene lighting techniques and the effects of it
- 2.4 demonstrate an understanding of image resolution and digital file formats

Grade 12 students will be expected to

- 2.5 control light using advanced manual settings of a camera and existing light photography methods
- 2.6 demonstrate an understanding of photojournalism
- 2.7 demonstrate an understanding of manipulating raw images from cameras that support it
- 2.8 practice a variety of professional applications of photography

**Choose any three modules from the following six.**

## Module 3: Technical Design

Grade 11 students will be expected to

- 3.1 create three-dimensional designs through digital solid modelling techniques
- 3.2 demonstrate an understanding of orthographic and isometric projection through digital solid modelling techniques
- 3.3 demonstrate an understanding of technical communication language and symbols

Grade 12 students will be expected to

- 3.4 demonstrate an understanding of basic plan views and elevation views of an object or structure
- 3.5 use mechanical and technical communication language and symbols to create and illustrate a digital solid model
- 3.6 create advanced geometric constructions through digital techniques

## Module 4: Graphic Design

Grade 11 students will be expected to

- 4.1 demonstrate an understanding of the principles and elements of design
- 4.2 demonstrate effective use of the colour wheel for graphic design
- 4.3 demonstrate an understanding of appropriate uses of typography for graphic design
- 4.4 communicate a message by manipulating images and words using a digital format
- 4.5 use appropriate settings for output of images for web use

Grade 12 students will be expected to

- 4.6 design, create, and transport digital images for specific communication purposes
- 4.7 distinguish between vector and raster objects
- 4.8 solve visual communication problems using appropriate elements, colours, typography, and principles of design

## Module 5: Web Publishing

Grade 11 students will be expected to

- 5.1 plan, design, and create a web interface and navigation system within a website
- 5.2 identify the elements of a web page
- 5.3 identify basic HTML code
- 5.4 create and edit web-appropriate graphics, photographs, and written text

Grade 12 students will be expected to

- 5.5 plan, design, create, and publish a web site to a network in a school-based Intranet
- 5.6 create and write web-based forms
- 5.7 develop motion graphics and presentations for web use

## Module 6: Video Production

Grade 11 students will be expected to

- 6.1 use a digital video camera and tripod safely and appropriately to capture video
- 6.2 incorporate sound tracks into video
- 6.3 edit video using a digital format
- 6.4 compress a video for electronic distribution

Grade 12 students will be expected to

- 6.5 create, edit, and distribute web appropriate video
- 6.6 capture high-quality sound for a video
- 6.7 incorporate narration or voice-over into a video
- 6.8 incorporate dramatic lighting into a video

## **Module 7: Broadcasting**

Grade 11 students will be expected to

- 7.1 practice using different modalities and applications of broadcasting through various roles within a broadcast studio
- 7.2 identify broadcasting equipment and the various range of broadcast signals
- 7.3 produce a broadcast for a specific purpose
- 7.4 practice journalism story form to broadcast a message

Grade 12 students will be expected to

- 7.6 demonstrate an understanding of how satellite technology affects them
- 7.7 communicate a message through script writing for specific broadcasting applications
- 7.8 demonstrate an understanding of broadcasting frequencies and bandwidth
- 7.9 use and operate broadcasting equipment to produce a broadcast or series of broadcasts for a specific purpose

## **Module 8: Animation**

Grade 11 students will be expected to

- 8.1 demonstrate an understanding of storyboarding techniques for animation
- 8.2 demonstrate an understanding of the fundamentals of sequencing moving digital images
- 8.3 create an animation that has a purpose and message

Grade 12 students will be expected to

- 8.4 create a storyboard to plan and communicate an animation sequence
- 8.5 create a two-dimensional (2-D) or three-dimensional (3-D) digital animation that has a purpose and message
- 8.6 insert sound into a digital animation

# Module 1: Fundamentals of Communications Technology

## Module Overview

The outcomes in this module are designed to be integrated into the other modules of study throughout the course. Very little designated time should be devoted to addressing the outcomes in this module. They are best addressed as part of the overall mandatory and selected modules that will comprise the course. For example, history, careers, and safety outcomes can be addressed as it relates to photography when studying that module.

## Module Outcomes

Grade 11 students will be expected to

- 1.1 demonstrate an understanding of the history of communication
- 1.2 investigate their strengths related to career options in communications technology
- 1.3 generate a professional portfolio representing a collection of work completed throughout the course using the design process
- 1.4 determine and create solutions to design problems that can persuade or entertain an audience using a variety of electronic communications tools
- 1.5 demonstrate an understanding of the social and environmental impacts of communications technology
- 1.6 demonstrate an understanding of life-cycle analysis of modern communications equipment and processes
- 1.7 demonstrate safe practices when using communications technology tools and equipment

Grade 12 students will be expected to

- 1.8 investigate modern and future forms of communication and predict futuristic career options in communications technology
- 1.9 generate a digital professional portfolio representing a collection of advanced work completed throughout the course using the design process
- 1.10 design, create, and transport solutions to design problems that can entertain a variety of target audiences using a variety of electronic communications tools
- 1.11 examine and analyse solutions to communications technology problems
- 1.12 create a design improvement to the life-cycle analysis of an electronic communication device
- 1.13 establish a safe practice policy for one or more communication technology processes within the classroom laboratory

**GCO: Students will be expected to demonstrate an understanding of the history and evolution of technology, and of its social and cultural implications.**

**GCO: Students will be expected to demonstrate an understanding of current and evolving careers and of the influence of technology on the nature of work.**

## Outcomes

Grade 11 students will be expected to

- 1.1 demonstrate an understanding of the history of communication
- 1.2 investigate their strengths related to career options in communications technology
- 1.3 generate a professional portfolio representing a collection of work completed throughout the course using the design process

Grade 12 students will be expected to

- 1.8 investigate modern and future forms of communication and predict futuristic career options in communications technology
- 1.9 generate a digital professional portfolio representing a collection of advanced work completed throughout the course using the design process

## Suggestions for Assessment

### **The Assessment Process**

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Before beginning any of the suggested activities, engage students in the assessment process by working together to do the following:

- *Co-construct criteria*—Students will take ownership of the project or assignment if they are involved in deciding how it will be assessed. This can be done by showing students a large variety of sample work so that students can see there are different ways to represent their knowledge while using the same criteria.
- *Provide regular feedback throughout the process*—When students are involved in a project or assignment, they will continue to learn as they self-assess and as the teacher provides feedback to help inform what needs to be learned next.

### **Suggested Activities**

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#### **HISTORY OF COMMUNICATIONS ACTIVITY**

Students can research and present their findings on the history of a particular area of communications technology (this should be done as part of any one of the course modules).

**CAREER PRESENTATION**

After students have completed career investigations, they could make a presentation to the class about a chosen career and make career recommendations to the class (this should be done as part of any one of the course modules).

**PROFESSIONAL PORTFOLIO FRAMEWORK**

As students prepare to design a professional portfolio, they can create a concept development (paper or electronic) to begin to frame the topics and links, colour, and design. This will involve using the design process ([link](#)).

## Suggestions for Learning and Teaching

**Career Searching**

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As students engage in the various modules offered throughout this course, they should be encouraged to complete career navigation quizzes related to the topic of study to determine their strengths (e.g., careers related to photography or new media such as animation, film, or broadcasting). See the Service Canada Job Bank at [jobsetc.gc.ca](http://jobsetc.gc.ca).

Students can document their career search activities on the [Career Search Report](#) sheet in Appendix A.

**Presentations**

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Provide expectations for completing a presentation (using presentation software, web based, or other methods). Also offer students tips on presentation skills ([link](#)) and work together to determine presentation guidelines.

**Professional Portfolio**

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Show students how to complete a concept development as part of their planning for the Professional Portfolio. Search Google images for “concept development site map” or find example here. [ploctau.com/how-tos/web\\_development/web\\_development\\_101\\_sitemap.gif](http://ploctau.com/how-tos/web_development/web_development_101_sitemap.gif)

**Career Exploration**

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Provide instruction to students about career exploration so that they have some strategies for continuing their search throughout the various course modules. This could include bringing in guests, having students interview professionals and show interviews to the class, and could include providing specific websites, such as [careerplanning.about.com](http://careerplanning.about.com) and [www.youth.gc.ca/eng/topics/career\\_planning/index.shtml](http://www.youth.gc.ca/eng/topics/career_planning/index.shtml)

## The (Green) Design Process

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Provide instruction to students on The (Green) Design Process (link) as they prepare to design the framework of their professional portfolio. This will involve consulting other similar sites to get some ideas. Allow students some search time with specific criteria to observe, such as use of colour, navigation topics, font, and design layout.

## Notes

- Service Canada Job Bank ([jobsetc.gc.ca/toolbox/quizzes/quizzes\\_home.do](http://jobsetc.gc.ca/toolbox/quizzes/quizzes_home.do))
- Presentation skills for students to remember:
  - prepare notes as a reference, but do not read them word for word
  - keep on-screen presentation notes to a minimum (6x6 max - six words across and six lines down)
  - speak clearly
  - look up and speak out, not down
  - stand up straight and smile at your audience
  - explain on-screen notes, but do not read them word for word
- Teachers should encourage writing opportunities for students, being clear on the expectations for content by creating scoring rubrics together (co-construct criteria).
- Allow students to keep a work folder in the classroom in a designated file drawer to keep ongoing project work organized and intact.
- Reporting methods could also include creating a play or a tableau or visual presentation based on student strengths.
- Having two students searching together makes the process go more quickly as students search the computer screen for relevant information.
- Students can link electronic presentations and other electronic work to their portfolio.
- When students write journal entries to document their work, teachers are encouraged to review for content more than for syntax, but always provide feedback on everything.
- Part of learning about specific careers involves knowing what qualifications and study requirements are involved. Nova Scotia Community College offers many programs that align with the modules in Communications Technology 11 and Communications Technology 12.
- For more information on assessment for learning, see *Making Classroom Assessment Work*, Second Edition, by Anne Davies. (NSSBB# 18637)



**GCO: Students will be expected to design, develop, evaluate, and articulate technological solutions.**

## Outcomes

Grade 11 students will be expected to

- 1.4 determine and create solutions to design problems that can persuade or entertain an audience using a variety of electronic communications tools

Grade 12 students will be expected to

- 1.10 design, create, and transport solutions to design problems that can entertain a variety of target audiences using a variety of electronic communications tools
- 1.11 examine and analyse solutions to communications technology problems

## Suggestions for Assessment

### Target Audiences

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As students begin to solve design problems throughout the subsequent modules that make up this course, they will need to consider the audience that they are designing for. Work with students to co-construct criteria for identifying and considering target audiences. Prepare sample work to help identify criteria topics.

Some questions to ask during the co-constructing process could include:

- What age group would this design be targeted for?
- How can colour influence the target audience?
- How does text influence the target audience?
- What sounds would be appropriate for this target audience?
- What sorts of things make it evident that a certain TV commercial is designed for a specific audience?
- What criteria are evident in a print ad designed for a specific target audience?

### Variety of Tools and Processes

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Students will need access to a variety of tools and processes to create and solve design problems within this course. This will require having a wide variety of such tools available within the school such as various modes of print, digital photographic equipment, studio lighting, and video and audio equipment.

Work with students to help identify a broad range of tools and processes necessary to solve the problem. Use what is available and consider how you can broaden their access by extending into the school and the community. Use freeware and open source software where possible and consider more than just the computer as a communication tool.

## **Suggested Activities**

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Examples of design problems that will address these outcomes and can be completed within modules at various stages and levels throughout Communications Technology include:

- screen printed T-shirts or other products
- website design
- podcasts or vodcasts
- promotional or school commercial video
- motion graphics
- specific styles of photographs
- a sporting event report
- logo design
- solid model with mechanical views of an object
- floor plan

## **Suggestions for Learning and Teaching**

As part of instruction for these outcomes, teachers can do the following:

- work with students to prepare an observational checklist in order to provide feedback to the students throughout the process of solving specific design problems
- provide grade 12 students with instruction on transporting or exporting (where appropriate) their final product to a variety of destinations (such as burning to a CD or DVD, exporting as a portable document file, publishing to the web)
- work with students to identify the difference between target audiences and students' personal design preferences
- prepare a series of examples of design work from industry that appeal to a variety of target audiences
- prepare tools and materials to provide students with a variety of laboratory experiences related to communications such as computer hardware, software, peripheral devices, and printing equipment
- demonstrate the communication systems or processes in the laboratory that could be used or are available to solve design problems

## Notes

The [\(Green\) Design Process](#) differs from the regular design process in that it involves “life-cycle analysis.” This process considers all aspects of society, the environment, and the economy as it relates to a product or process from before the beginning of its life until after it is no longer useful. Life-cycle analysis should be considered as part of the design process so as to create better designs for the environment as a whole.

The list of design problem ideas for each of the modules within this course is long and all have the potential of addressing the above outcomes.

**GCO: Students will be expected to demonstrate an understanding of the consequences of their technological choices.**

## Outcomes

Grade 11 students will be expected to

- 1.5 demonstrate an understanding of the social and environmental impacts of communications technology
- 1.6 demonstrate an understanding of life-cycle analysis of modern communications equipment and processes
- 1.7 demonstrate safe practices when using communications technology tools and equipment

Grade 12 students will be expected to

- 1.12 create a design improvement to the life-cycle analysis of an electronic communication device
- 1.13 establish a safe practice policy for one or more communication technology processes within the classroom laboratory

## Suggestions for Assessment

Refer to page 14, [The Assessment Process](#), before beginning the suggested activities with students.

### **Suggested Activities**

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#### **ENVIRONMENTAL EXPOSEE ACTIVITY**

Students can complete a school audit of paper recycling (or print cartridge recycling or other communications related waste) by creating a “Where does it come from and where does it go?” photo story. Students can then create a recycling program for the materials based on the results of the audit. See photo story samples here: [teachnet.ie/innovative\\_teacher/default.asp?NCID=365](http://teachnet.ie/innovative_teacher/default.asp?NCID=365)

#### **RESPONSIBLE PRINTING PHOTO STORY**

As students begin to research and appreciate environmentally friendly printed products, they can create a video or photo story on a particular product that stands out as environmentally responsible. This might require communicating with a company via e-mail or conducting a site visit.

#### **PROMOTIONAL VIDEO**

Students can generate a promotional video (or photo story) on safe practices and environmental impacts for a specific process in communications technology (such as handling, using, and discarding studio lights). The video could include all aspects of use and care as well as the life-cycle of that product. Students can answer questions such as, How was this product made? What was involved or suffered in making it? How is it most safely used? and How will we discard of its parts during and

at the end of its life? Questions like these will help students to consider all aspects of safety, the environment, and the life-cycle of a product.

## Suggestions for Learning and Teaching

### Life-Cycle Analysis and the Environment

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Teachers will need to engage students in discussions about life-cycle analysis before beginning projects that involve unpacking the life cycle of a product. Part of the learning process about the life cycle of a product will involve research and having discussions in class. ([Life-Cycle Analysis](#) explained.) Teachers and students can work together in the learning process while trying the following:

- examine the life cycle of a product that is used as part of their communications technology course and determine what was involved in creating that product
- complete research on life-cycle analysis and consider how it applies to the equipment in the classroom laboratory
- discuss the environmental impacts of communications technology equipment and processes in terms of power consumption, recycling, manufacturing, society, and the economy
- provide examples of life-cycle analysis from industry and discuss the methods by which students can implement this technique throughout the design process in the course modules
- offer materials to students that are conducive to the life-cycle approach (water-based inks, recycled products)
- provide instruction on [life-cycle analysis](#)
- engage students in a discussion about designing for the environment
- have students generate an estimate of cost of communicating at home in any capacity
- discuss the need for life-cycle analysis techniques in the design of products and services and how it affects the world

### Safety

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Safety in the Communications Technology laboratory will depend on which processes and equipment are being used. Discuss laboratory safety with students before beginning any activities and develop safe practices together. Consider the following as part of teaching the safety program:

- establish safe practices and follow safety rules for use and care of equipment in the laboratory
- demonstrate to the teacher safe and proper use of equipment used in the laboratory
- document student safety demonstrations
- discuss laboratory safety with the students and develop safe practices together
- keep observational records regarding safety available for students to see
- provide safety instruction for equipment used to ensure students work safely
- outline safety expectations related to safe attitudes and appropriate behaviour in the laboratory
- provide safety demonstrations in small groups

- establish consequences with students when expectations of safety are not met

## Notes

- *Cradle to Cradle: Remaking the Way We Make Things*. McDonough, William, and Michael Braungart, North Point Press. (ISBN: 9780865475878)
- Google "Green Design."
- Google "Exporting Junk" with United Nations Environment Program (UNEP) to learn more about electronics communications equipment recycling programs (or lack thereof).
- Things to consider for safety in the communications technology laboratory:
  - safe posture
  - heat for transfer curing machines
  - UV light tables
  - inks, chemicals, and film for screen printing
  - safe practices for equipment
  - electrical hazards
  - tripods and light stands
- Safe practices in the communications technology laboratory must be established as soon as students enter the laboratory as well as throughout the course.
- When assessing safe attitudes, teachers should use an anecdotal record with dates/times for when students are presenting an uncaring attitude or inappropriate behaviour around equipment.

# Module 2: Digital Photography

## Module Overview

The Digital Photography module is mandatory for Communications Technology 11 and Communications Technology 12. Students will discover that appropriate knowledge and understanding of photographic communications will create a foundation of transferable skills that will apply to many other aspects of communications technology.

## Module Outcomes

Grade 11 students will be expected to

- 2.1 demonstrate an understanding of the basic operation and care of a digital camera
- 2.2 practice various photographic techniques and photographic composition using a single lens reflex camera and tripod
- 2.3 explore various scene lighting techniques and the effects of it
- 2.4 demonstrate an understanding of image resolution and digital file formats

Grade 12 students will be expected to

- 2.5 control light using advanced manual settings of a camera and existing light photography methods
- 2.6 demonstrate an understanding of photojournalism
- 2.7 demonstrate an understanding of manipulating raw images from cameras that support it
- 2.8 practice a variety of professional applications of photography

## **Integrated outcomes that can be addressed in this module**

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Grade 11 students will be expected to

- 1.1 demonstrate an understanding of the history of communication
- 1.2 investigate their strengths related to career options in communications technology
- 1.3 generate a professional portfolio representing a collection of work completed throughout the course using the design process
- 1.4 determine and create solutions to design problems that can persuade or entertain an audience using a variety of electronic communications tools
- 1.5 demonstrate an understanding of the social and environmental impacts of communications technology
- 1.6 demonstrate an understanding of life-cycle analysis of modern communications equipment and processes
- 1.7 demonstrate safe practices when using communications technology tools and equipment

Grade 12 students will be expected to

- 1.8 investigate modern and future forms of communication and predict futuristic career options in communications technology
- 1.9 generate a digital professional portfolio representing a collection of advanced work completed throughout the course using the design process
- 1.10 design, create, and transport solutions to design problems that can entertain a variety of target audiences using a variety of electronic communications tools
- 1.11 examine and analyse solutions to communications technology problems
- 1.12 create a design improvement to the life-cycle analysis of an electronic communication device
- 1.13 establish a safe practice policy for one or more communication technology processes within the classroom laboratory



**GCO: Students will be expected to operate and manage technological systems.**

## Outcomes

Grade 11 students will be expected to

- 2.1 demonstrate an understanding of the basic operation and care of a digital camera
- 2.2 practice various photographic techniques and photographic composition using a single lens reflex camera and tripod
- 2.3 explore various scene lighting techniques and the effects of it
- 2.4 demonstrate an understanding of image resolution and digital file formats

Grade 12 students will be expected to

- 2.5 control light using advanced manual settings of a camera and existing light photography methods
- 2.6 demonstrate an understanding of photojournalism
- 2.7 demonstrate an understanding of manipulating raw images from cameras that support it
- 2.8 practice a variety of professional applications of photography

## Suggestions for Assessment

Refer to page 14, [The Assessment Process](#), before beginning the suggested activities with students.

As students begin to solve design problems, they should record their work in their professional portfolio. They can choose to make it available for viewing or not, but it can all be accessed from the portfolio.

## Design Problem Activity Ideas

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### INSTRUCTION MANUAL OR VIDEO

As students begin to practice safe use and care of a digital camera, they can take pictures or videos of each other performing specific digital camera operations, such as changing the battery or removing the lens safely. As they work to complete this task they will obtain feedback from the teacher as well as each other, rerecording until they are satisfied with the product. An alternative to this design problem is to create an instruction manual or video for a specific task with the digital camera. Students can address outcomes from the video production module as well with this design problem.

### COMIC ACTIVITY

Students can write a comic (using comic creation software) about the process required for the “handle with care” features of a digital camera.

### **A-DAY-IN-MY-LIFE PHOTO STORY**

This activity requires that students take the camera home. They proceed to photograph (or have others help photograph them) each stage of their day, compiling the photographs into an electronic photo story depicting a typical day in their life. Students can present it to their class (on a timed presentation) without actually standing in front of the class.

### **STORYBOOK DESIGN**

Students can write a very short story and then photograph the story and compile it in a storybook software (or in hard copy) without the narrative. Ultimately the students should be able to “tell” the story with only the photographs. This activity could also be a “children’s story design.”

### **OTHER DESIGN PROBLEM ACTIVITY IDEAS**

- Create a magazine cover design for a specific style of magazine (of interest to them, and following appropriate guidelines) using their photography skills
- Create an awareness campaign poster for a local service club or school-based event or group
- Design a yearbook page layout, including taking the photographs
- Create a newsletter to promote a school subject area
- Compose a CD and create the design for the cover

## **Suggestions for Learning and Teaching**

### **Basic Use and Care of a Camera**

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Teachers should begin the photography module with a great deal of instruction on the following:

- appropriate use and care of a digital camera
- the five basic parts of the camera (body, lens, view finder, recording medium, shutter)
- demonstrate all the basic camera operations to small groups of students (this may be done while other students are completing a different task)
- demonstrate the importance of care of a camera lens
- demonstrate how to safely install the camera on a tripod

[usa.canon.com/dlc/controller?act=TipsAndTechsAct](http://usa.canon.com/dlc/controller?act=TipsAndTechsAct)  
[digital-photography-school.com/](http://digital-photography-school.com/)

As part of learning basic skills in the use and care of a digital camera, students will need to practice handling the camera and performing the following functions:

- manipulate a camera to identify the basic parts
- change cards and batteries in a camera
- turn a camera on and off

- change from auto to portrait and other settings
- charge the camera batteries
- download photos from a camera to a computer
- install the camera on a tripod
- change the camera lens
- change file or image capture size within the camera

## Lighting

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As students have gained experiences in basic camera function, teachers will need to provide instruction about the following related to lighting:

- three basic types of lighting: natural, existing, and artificial
- additional types of lighting: backlighting, Rembrandt lighting, rear lighting, front lighting, key lighting, colour temperature, three-point light set-up, flash light, natural light

[www.photoflexlightingschool.com/Lighting\\_Lessons/index.html](http://www.photoflexlightingschool.com/Lighting_Lessons/index.html)  
[3drender.com/light/3point](http://3drender.com/light/3point)

Students will need to gain a great deal of experience through practice to learn to be effective with photographic communication, particularly related to lighting. Digital cameras are ideal for this as they can provide students with instant feedback. Students will need to practice the following techniques as part of learning about photographic lighting:

- turn the flash on or off to take the same picture
- take a picture using a photo studio set-up to identify three-point lighting
- practice taking pictures by adding lighting and changing the lighting to produce different results ([photoflexlightingschool.com](http://photoflexlightingschool.com) is very helpful for this practice)
- take a picture of a person sitting next to a window with only natural light, changing lighting techniques until the desired lighting is reached
- set up a photo studio in 3-point lighting and take a picture of it

## Basic Photographic Communication

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Teachers will need to guide students through a series of instruction and learning opportunities related to photographic composition as well as using an SLR (single lens reflex) camera effectively. Students will need to be provided with time to practice. Teachers can provide instruction on the following:

- basic photographic composition

[digital-photography-school.com/digital-photography-composition-tips](http://digital-photography-school.com/digital-photography-composition-tips)

- focal length

- depth of field (controlled by aperture and distance from subject)
- camera settings (ISO ratings, aperture setting [f-stop], shutter speed)
- the importance of using a tripod related to shutter speed
- the specific modes of digital camera operation (portrait, spotlight, landscape)
- panning, stopping action, image stabilization
- leading lines and moving close to avoid background clutter

Students will need to practice the techniques from above as part of their on-going learning. Teachers will need to provide feedback throughout the learning and practice stages. Students can work in groups of two or three to practice the following:

- practice taking a picture to make it look sinister or make it look happy
- take a picture of a row of fence posts or students or rocks or computers
- make the foreground in a picture in focus and the background out of focus
- take a picture of the same object up close and further away
- move while holding the camera as another student moves to take a panned picture
- identify images that have different aperture openings
- change only the shutter speed to practice taking photographs of moving things (moving water, drummer drumming, person playing guitar)
- take an overexposed and an underexposed picture by changing the shutter speed (take the same picture while changing only the shutter speed to make three different effects)

## **Digital Image Manipulation**

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An important component of digital photography is the ability to manipulate images after they have been digitized and transferred to computer. Teachers will need to provide instruction on the following topics to help students select the appropriate settings with which to take a digital photograph:

- lens quality versus picture size (megapixels)
- transfer time, image size, and resolution as it relates to web publishing
- the difference between optical zoom and digital zoom
- ask What do we want to do with a picture? (This will determine the file type and size.)
- determine the end product (Knowing the end product will determine how they approach the picture.)
- RAW versus JPEG files, etc.

After students have had some practice composing good photographs, they will need to begin the process of learning about resolution, image size, and file types. As they begin to explore these areas of digital photography, students can experiment with the following:

- practice using optical zoom versus digital zoom
- take a picture and save it as three different file types and observe the difference in file size (JPEG, TIFF, PNG, GIF)

- take the same images and magnify them to note differences
- experiment with RAW files (.raw) that do not include compression using Adobe Light Table or Apple Aperture (or iPhoto)
- (the software can do colour balancing with raw images rather than the camera)

## Notes

- Comic creation: Comic Life is an excellent tool for creating comic communication. However, there is a flaw in the saving feature of this software. Saving to a USB drive will not allow the project to be reopened later. Be sure students save their Comic Life projects to a hard drive or network space.
- Begin teaching photography by changing only one variable (setting) at a time, where possible, to avoid confusion with beginners.
- Photographic Composition:
  - Rule of Thirds: Divide the frame of a photograph into three equal pieces horizontally and vertically. Place the subject (or the point of interest) at one of the 1/3 sections. ([digital-photography-school.com/rule-of-thirds](http://digital-photography-school.com/rule-of-thirds))
- Framing techniques: Using a natural object to frame a picture, such as a tree or door ([digital-photography-school.com/6-tips-for-perfect-composition-in-portrait-photography#](http://digital-photography-school.com/6-tips-for-perfect-composition-in-portrait-photography#))
- Avoiding mergers (colours and objects blending)
- Moving close will avoid background clutter.
- Camera Settings
  - F-stop (aperture)—The size of the lens opening in a camera (like the pupil of the eye). Aperture is adjustable in an SLR camera.
  - ISO ratings—Sensitivity of the microchip (CCD cell for example) that determines the amount of light needed for effective exposure.
  - Shutter speed—The amount of time the shutter is open to allow light in.
  - Focal length (zoom)—Allows for a greater distance between the lens and the film (or recording medium) to focus on objects further away ([paragon-press.com/lens/lenchart.htm](http://paragon-press.com/lens/lenchart.htm))
- Lighting ([3drender.com/light/3point](http://3drender.com/light/3point))
- Megapixel calculator ([web.forret.com/tools/megapixel.asp?width=640&height=480](http://web.forret.com/tools/megapixel.asp?width=640&height=480))
- Free downloads of photo editing software:
  - Picasa ([picasa.google.ca](http://picasa.google.ca)) (PC)
  - Picasa ([picasa.google.com/mac](http://picasa.google.com/mac)) (Mac)
  - paint.net ([paint.net](http://paint.net))
- ProudPhotography.com, on-line photography course ([proudphotography.com/#](http://proudphotography.com/#))
- Canon Digital Learning Center [usa.canon.com/dlc/controller?act=GetProductAct&productID=210](http://usa.canon.com/dlc/controller?act=GetProductAct&productID=210)



# Module 3: Technical Design

## Module Overview

The Technical Design module allows students to explore the concept of mechanical or technical drawing in a modern format. In addition to traditional technical drawing software, students will have the opportunity to explore solid modelling software to represent their design work.

## Module Outcomes

Grade 11 students will be expected to

- 3.1 create three-dimensional designs through digital solid modelling techniques
- 3.2 demonstrate an understanding of orthographic and isometric projection through digital solid modelling techniques
- 3.3 demonstrate an understanding of technical communication language and symbols

Grade 12 students will be expected to

- 3.4 demonstrate an understanding of basic plan views and elevation views of an object or structure
- 3.5 use mechanical and technical communication language and symbols to create and illustrate a digital solid model
- 3.6 create advanced geometric constructions through digital techniques

## **Integrated outcomes that can be addressed in this module**

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Grade 11 students will be expected to

- 1.1 demonstrate an understanding of the history of communication
- 1.2 investigate their strengths related to career options in communications technology
- 1.3 generate a professional portfolio representing a collection of work completed throughout the course using the design process
- 1.4 determine and create solutions to design problems that can persuade or entertain an audience using a variety of electronic communications tools
- 1.5 demonstrate an understanding of the social and environmental impacts of communications technology
- 1.6 demonstrate an understanding of life-cycle analysis of modern communications equipment and processes
- 1.7 demonstrate safe practices when using communications technology tools and equipment

Grade 12 students will be expected to

- 1.8 investigate modern and future forms of communication and predict futuristic career options in communications technology
- 1.9 generate a digital professional portfolio representing a collection of advanced work completed throughout the course using the design process
- 1.10 design, create, and transport solutions to design problems that can entertain a variety of target audiences using a variety of electronic communications tools
- 1.11 examine and analyse solutions to communications technology problems
- 1.12 create a design improvement to the life-cycle analysis of an electronic communication device
- 1.13 establish a safe practice policy for one or more communication technology processes within the classroom laboratory



**GCO: Students will be expected to design, develop, evaluate, and articulate technological solutions.**

## Outcomes

Grade 11 students will be expected to

- 3.1 create three-dimensional designs through digital solid modelling techniques
- 3.2 demonstrate an understanding of orthographic and isometric projection through digital solid modelling techniques
- 3.3 demonstrate an understanding of technical communication language and symbols

Grade 12 students will be expected to

- 3.4 demonstrate an understanding of basic plan views and elevation views of an object or structure
- 3.5 use mechanical and technical communication language and symbols to create and illustrate a digital solid model
- 3.6 create advanced geometric constructions through digital techniques

## Suggestions for Assessment

Refer to page 14, [The Assessment Process](#), before beginning the suggested activities with students.

As students begin to solve design problems, they should record their work in their professional portfolio. They can choose to make it available for viewing or not, but it can all be accessed from the portfolio.

### Design Problem Activity Ideas

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Students can create solutions to design problems such as

- a new cell phone that performs a specific design function or has a specific design feature
- a coffee mug that fits into a specific cup holder for a vehicle
- a storage and display design problem specific to something they need plans for
- steering wheel design that accommodates air bag requirements while allowing drivers to hold the wheel at 10 and 2

Teachers can

- provide samples for students to visualize good products
- provide feedback to students about the expectations of technical drawings as they are in the process of completing them
- work with students to co-construct criteria for all technical design work

# Suggestions for Learning and Teaching

Students can

- identify some examples of designs that appeal to various audiences using printed media and web references
- practice using software and hardware available for doing technical drawing
- practice orthographic and isometric projection using both paper and pencil and CAD software
- generate orthographic drawings from digital solid models and compare the relationship between the three views and the solid model
- take measurements of actual objects in real life to practise getting a sense of size as compared to computer drawing dimensions
- practice using solid modelling software by way of tutorials

Teachers can

- provide printed and electronic samples that demonstrate good work in technical design
- provide instruction on orthographic and isometric projection
- provide ongoing feedback to students as they practise tutorials
- present examples of appropriate design solutions
- communicate specifications of the design problem and expectations of students throughout the module

## Notes

- Google SketchUp freeware for technical and mechanical drawing ([sketchup.google.com](http://sketchup.google.com))
- 4Teachers.org, Teach with Technology (a host of teaching and learning resources) ([www.4Teachers.org](http://www.4Teachers.org))
- RubiStar (create customized rubrics) ([rubistar.4teachers.org/index.php](http://rubistar.4teachers.org/index.php))
- 21Classes Cooperative Learning (free blogging site for students) ([www.21classes.com](http://www.21classes.com))
- Atomic Learning (Fantastic tutorials for learning specific software, old and new. Check with your board for licencing; most have access to it.) ([atomiclearning.com](http://atomiclearning.com))
- Media College.com (a free educational and resource website for all forms of electronic media) ([www.mediacollege.com](http://www.mediacollege.com))
- Traditional mechanical or technical drawing involved teaching students to look at a solid object and conceptualize that object into three views (orthographic projection) and then provide dimensions for that object. Students sometimes have difficulty with this concept. However, with the movement to solid modelling for mechanical or technical drawing, students begin with a solid shape (shape before size) and then begin to identify specific sizes for the parts of that shape. The computer generates the mechanical drawing and the dimensions for purposes of communicating the plan details. Solid modelling has had a profound influence on student interest and retention of concepts with students to approach technical design in this format.

# Module 4: Graphic Design

## Module Overview

The Graphic Design module explores the elements and principles of design as it applies to print and other media. It can involve design problems in graphic and print production, visual communication, screen printing, logo design, and identifying between vector and raster graphic images. This module may lend itself to using photography and web design as an integration piece.

## Module Outcomes

Grade 11 students will be expected to

- 4.1 demonstrate an understanding of the principles and elements of design
- 4.2 demonstrate effective use of the colour wheel for graphic design
- 4.3 demonstrate an understanding of appropriate uses of typography for graphic design
- 4.4 communicate a message by manipulating images and words using a digital format
- 4.5 use appropriate settings for output of images for web use

Grade 12 students will be expected to

- 4.6 design, create, and transport digital images for specific communication purposes
- 4.7 distinguish between vector and raster objects
- 4.8 solve visual communication problems using appropriate elements, colours, typography, and principles of design

## **Integrated outcomes that can be addressed in this module**

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Grade 11 students will be expected to

- 1.1 demonstrate an understanding of the history of communication
- 1.2 investigate their strengths related to career options in communications technology
- 1.3 generate a professional portfolio representing a collection of work completed throughout the course using the design process
- 1.4 determine and create solutions to design problems that can persuade or entertain an audience using a variety of electronic communications tools
- 1.5 demonstrate an understanding of the social and environmental impacts of communications technology
- 1.6 demonstrate an understanding of life-cycle analysis of modern communications equipment and processes
- 1.7 demonstrate safe practices when using communications technology tools and equipment

Grade 12 students will be expected to

- 1.8 investigate modern and future forms of communication and predict futuristic career options in communications technology
- 1.9 generate a digital professional portfolio representing a collection of advanced work completed throughout the course using the design process
- 1.10 design, create, and transport solutions to design problems that can entertain a variety of target audiences using a variety of electronic communications tools
- 1.11 examine and analyse solutions to communications technology problems
- 1.12 create a design improvement to the life-cycle analysis of an electronic communication device
- 1.13 establish a safe practice policy for one or more communication technology processes within the classroom laboratory

**GCO: Students will be expected to design, develop, evaluate, and articulate technological solutions.**

## Outcomes

Grade 11 students will be expected to

- 4.1 demonstrate an understanding of the principles and elements of design
- 4.2 demonstrate effective use of the colour wheel for graphic design
- 4.3 demonstrate an understanding of appropriate uses of typography for graphic design
- 4.4 communicate a message by manipulating images and words using a digital format
- 4.5 use appropriate settings for output of images for web use

Grade 12 students will be expected to

- 4.6 design, create, and transport digital images for specific communication purposes
- 4.7 distinguish between vector and raster objects
- 4.8 solve visual communication problems using appropriate, elements, colours, typography, and principles of design

## Suggestions for Assessment

Refer to page 14, [The Assessment Process](#), before beginning the suggested activities with students.

As students begin to solve design problems, they should record their work in their professional portfolio. They can choose to make it available for viewing or not, but it can all be accessed from the portfolio.

### Design Problem Activity Ideas

Students can create solutions to design problems such as:

- *Newspaper Front Page Design and Layout*—Front pages of various editions and sections of the *Chronicle Herald* are made available to students. After identifying the elements of a Newspaper front page, the students use design software to recreate the page layout as closely as possible, writing or filling columns with text of their choosing. This is a jumping off position to creating a school newspaper.
- A yearbook two-page spread layout
- An orientation binder for the school
- A logo design for a real group or client (teaming up with the entrepreneurship class could work)
- Complete a promotional campaign using photography, web broadcasting, etc.
- T-shirt/printed material design
- Promotional material for a school event using a common design theme

Teachers can

- work with students to co-construct criteria for assignments
- provide a variety of sample work to determine criteria

## Suggestions for Learning and Teaching

Students can

- identify some examples of designs that appeal to a variety of target audiences (using printed media and web references)
- identify other examples of print or media design that would appeal to a variety of audiences
- use the recommended texts to identify examples of work that has been altered to incorporate the principles of design for media and printed material
- practise using software and hardware available for designing print and electronic media
- practise identifying the principles of design in sample work from magazines, websites, and logo designs
- apply the principles of design to their work
- shop for software that would be appropriate for specific tasks

Teachers can

- teach page layout using free samples (brochures, etc.) from outside sources
- provide printed and electronic samples that demonstrate the principles of design (refer to *Non-Designer's Design Book* and *Non-Designer's Web Book*)
- teach students the elements of "logo design"
- discuss which software is best as a tool to solve this design problem
- work with students to identify the difference between target audiences and students' personal design preferences
- prepare a series of examples of design work from industry (logos, magazine advertisements, business cards, websites) that appeal to a variety of target audiences (e.g., pre-school age websites versus entertainment industry media versus investment portfolio websites)
- prepare tools and materials to provide students with a variety of laboratory experiences related to communications such as computer hardware, software, peripheral devices, and printing equipment (e.g., button makers and screen printing systems)
- demonstrate the communication systems or processes in the laboratory that could be used or are available to solve design problems
- demonstrate the effective use of equipment
- demonstrate safety requirements as it relates to specific processes
- present examples of appropriate design solutions
- communicate specifications of the design problem and expectations of students throughout the module

## Notes

- Adobe Kuler: Use this on-line software to do live colour combinations for graphic design. ([adobe.com/products/kuler](http://adobe.com/products/kuler))
- Nova Scotia Community College, Graphic Design course information ([nsc.ca/Learning\\_Programs/Programs/PlanDescr.aspx?prg=GRDE&pln=GRAPHDES](http://nsc.ca/Learning_Programs/Programs/PlanDescr.aspx?prg=GRDE&pln=GRAPHDES))
- *The Non-Designer's Web Book* (NSSBB# 25264)
- *The Non-Designer's Design Book* (NSSBB # 25265)
- Principles of Design: contrast, repetition, alignment, proximity (see *The Non-Designer's Design Book*)
- Elements of Design: line, shape, mass, texture, colour
- Elements of Logo Design: text, geometric shape, graphic image (Combining two or more of the elements is generally a better design. The logo design must also follow the principles of design. Good logo design can begin by researching the topic through Google images using a variety of key words to identify components in others that relate to the design problem.)
- Microsoft Paint: A good software for students to practise drawing with a mouse; however, files do not convert well (BMP file, 256 colours)
- Media College.com (a free educational and resource website for all forms of electronic media) ([www.mediacollege.com](http://www.mediacollege.com))
- Photo editing software
  - Picasa ([picasa.google.ca](http://picasa.google.ca)) (PC)
  - Picasa ([picasa.google.com/mac](http://picasa.google.com/mac)) (Mac)
  - Paint.net ([paint.net](http://paint.net))
  - Pixa.com ([pixa.com](http://pixa.com))
- Adbusters, Print Ad (print your own ad) ([adbusters.org/spoofads/printad](http://adbusters.org/spoofads/printad))





# Module 5: Web Publishing

## Module Overview

Web publishing involves designing and writing a website for a specific purpose. Students should spend time writing and editing appropriate content for their web-based content. It is essential that web safety be emphasized throughout this module.

## Module Outcomes

Grade 11 students will be expected to

- 5.1 plan, design, and create a web interface and navigation system within a website
- 5.2 identify the elements of a web page
- 5.3 identify basic HTML code
- 5.4 create and edit web-appropriate graphics, photographs, and written text

Grade 12 students will be expected to

- 5.5 plan, design, create, and publish a website to a network in a school-based Intranet
- 5.6 create and write web-based forms
- 5.7 develop motion graphics and presentations for web use

## **Integrated outcomes that can be addressed in this module**

Grade 11 students will be expected to

- 1.1 demonstrate an understanding of the history of communication
- 1.2 investigate their strengths related to career options in communications technology
- 1.3 generate a professional portfolio representing a collection of work completed throughout the course using the design process
- 1.4 determine and create solutions to design problems that can persuade or entertain an audience using a variety of electronic communications tools
- 1.5 demonstrate an understanding of the social and environmental impacts of communications technology
- 1.6 demonstrate an understanding of life-cycle analysis of modern communications equipment and processes
- 1.7 demonstrate safe practices when using communications technology tools and equipment

Grade 12 students will be expected to

- 1.8 investigate modern and future forms of communication and predict futuristic career options in communications technology
- 1.9 generate a digital professional portfolio representing a collection of advanced work completed throughout the course using the design process
- 1.10 design, create, and transport solutions to design problems that can entertain a variety of target audiences using a variety of electronic communications tools
- 1.11 examine and analyse solutions to communications technology problems
- 1.12 create a design improvement to the life-cycle analysis of an electronic communication device
- 1.13 establish a safe practice policy for one or more communication technology processes within the classroom laboratory

**GCO: Students will be expected to design, develop, evaluate, and articulate technological solutions.**

## Outcomes

Grade 11 students will be expected to

- 5.1 plan, design, and create a web interface and navigation system within a website
- 5.2 identify the elements of a web page
- 5.3 identify basic HTML code
- 5.4 create and edit web-appropriate graphics, photographs, and written text

Grade 12 students will be expected to

- 5.5 plan, design, create, and publish a website to a network in a school-based Intranet
- 5.6 create and write web-based forms
- 5.7 develop motion graphics and presentations for web use

## Suggestions for Assessment

Refer to page 14, [The Assessment Process](#), before beginning the suggested activities with students.

As students begin to solve design problems, they should record their work in their professional portfolio. They can choose to make it available for viewing or not, but it can all be accessed from the portfolio.

### Design Problem Activity Ideas

- Students can plan a website as part of the overall school website by beginning with development of a site map (using a graphic organizer).
- Students can begin the web design process by creating a template or interface design for a website or a part of a website.
- Students can create a web-based electronic portfolio (can be used for all material in the course) to manage their course materials.
- Students can create a website for a specific non-profit client or fictional client.

## Suggestions for Learning and Teaching

Teachers can provide instruction on the following topics as part of the ongoing teaching and learning process in web design and publishing:

- File management, the importance of the index file, folder management
- Web colour, designing with tables, text limitations on the web
- Provide instruction on web authoring software management

- Source files, naming conventions, metatags, browsers, accessibility
- Creating and using web graphics
- Pictures for the web, file types, resolution and file size, dynamic (moving) content
- Forms for collecting information
- Provide instruction on authoring and managing a web site

As part of the ongoing learning process throughout designing for the web, students can practice the following:

- Begin the web design process by first searching the web for good design samples
- Refer to the *Non-Designer's Web Book* for design tips
- Create web graphics
- Animate GIFs and flash buttons—rollovers, save presentations as web compliant file
  - elements (e.g., hyperlinking, background, tables)
  - limitations (colour, font, size, graphic)

## Notes

- *The Non-Designer's Web Book* (NSSBB# 25264)
- picso ([pics-o.com](http://pics-o.com))
- atomic learning ([atomiclearning.com](http://atomiclearning.com))
- Discourage students from creating a personal website, but rather to create a site for a purpose
- Web Designer Forum ([webdesignerforum.co.uk](http://webdesignerforum.co.uk))
- Google Newsgroups is a helpful site for searching how to do specific things in specific software.
- Nvu is a free web-authoring system ([net2.com/nvu](http://net2.com/nvu))

# Module 6: Video Production

## Module Overview

The Video Production module should be considered an introduction to digital video. Short video clips will provide students with valuable experience and promote success. Students should be encouraged to integrate their work from this module into other modules.

## Module Outcomes

Grade 11 students will be expected to

- 6.1 use a digital video camera and tripod safely and appropriately to capture video
- 6.2 incorporate sound tracks into video
- 6.3 edit video using a digital format
- 6.4 compress a video for electronic distribution

Grade 12 students will be expected to

- 6.5 create, edit, and distribute web-appropriate video
- 6.6 capture high-quality sound for a video
- 6.7 incorporate narration or voice-over into a video
- 6.8 incorporate dramatic lighting into a video

## **Integrated outcomes that can be addressed in this module**

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Grade 11 students will be expected to

- 1.1 demonstrate an understanding of the history of communication
- 1.2 investigate their strengths related to career options in communications technology
- 1.3 generate a professional portfolio representing a collection of work completed throughout the course using the design process
- 1.4 determine and create solutions to design problems that can persuade or entertain an audience using a variety of electronic communications tools
- 1.5 demonstrate an understanding of the social and environmental impacts of communications technology
- 1.6 demonstrate an understanding of life-cycle analysis of modern communications equipment and processes
- 1.7 demonstrate safe practices when using communications technology tools and equipment

Grade 12 students will be expected to

- 1.8 investigate modern and future forms of communication and predict futuristic career options in communications technology
- 1.9 generate a digital professional portfolio representing a collection of advanced work completed throughout the course using the design process
- 1.10 design, create, and transport solutions to design problems that can entertain a variety of target audiences using a variety of electronic communications tools
- 1.11 examine and analyse solutions to communications technology problems
- 1.12 create a design improvement to the life-cycle analysis of an electronic communication device
- 1.13 establish a safe practice policy for one or more communication technology processes within the classroom laboratory

**GCO: Students will be expected to design, develop, evaluate, and articulate technological solutions.**

## Outcomes

Grade 11 students will be expected to

- 6.1 use a digital video camera and tripod safely and appropriately to capture video
- 6.2 incorporate sound tracks into video
- 6.3 edit video using a digital format
- 6.4 compress a video for electronic distribution

Grade 12 students will be expected to

- 6.5 create, edit, and distribute web-appropriate video
- 6.6 capture high-quality sound for a video
- 6.7 incorporate narration or voice-over into a video
- 6.8 incorporate dramatic lighting into a video

## Suggestions for Assessment

Refer to page 14, [The Assessment Process](#), before beginning the suggested activities with students.

As students begin to solve design problems, they should record their work in their professional portfolio. They can choose to make it available for viewing or not, but it can all be accessed from the portfolio.

### Design Problem Activity Ideas

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Students can create solutions to design problems such as:

- Producing a 20–30 second video as a product advertisement for another subject in school
- Creating a picture movie of themselves using video and still images from home
- Covering a sporting event and making a 20–30 second video spot for the school website
- Using the video they have already completed (edited) and compressing it or burning it for distribution
- Creating video announcements for the school

## Suggestions for Learning and Teaching

Teachers can provide instruction on the following topics as part of the on-going teaching and learning process in video production:

- Concepts such as framing, rule of thirds, roles of video production

- The importance of good quality sound
- Getting close to the subject allows for better sound options (e.g., if there is speaking going on, it should be audible)
- Using a sound mixer on the bottom of the camera (e.g., BeachTek)
- File conversions, first to QuickTime, etc.
- Importance of determining the destination of the video before production
- Compression options
- Web preparation versus high-resolution destination
- Providing video file formats lesson as necessary (music, background, ambient)
- Web preparation versus high-resolution destination
- Video file formats lesson as necessary (music, background, ambient)

## Notes

- Google search for software packages available for creating a picture story.
- Sound mixer on the bottom of most cameras (e.g., BeachTek)



# Module 7: Broadcasting

## Module Overview

The Broadcasting module explores the concept of communicating a message through print, web, radio, or video broadcasting methods. The concept of journalism is introduced. An understanding of writing in a non-traditional format is expected to develop in students.

## Module Outcomes

Grade 11 students will be expected to

- 7.1 practice using different modalities and applications of broadcasting through various roles within a broadcast studio
- 7.2 identify broadcasting equipment and the various range of broadcast signals
- 7.3 produce a broadcast for a specific purpose
- 7.4 practice journalism story form to broadcast a message

Grade 12 students will be expected to

- 7.6 demonstrate an understanding of how satellite technology affects them
- 7.7 communicate a message through script writing for specific broadcasting applications
- 7.8 demonstrate an understanding of broadcasting frequencies and bandwidth
- 7.9 use and operate broadcasting equipment to produce a broadcast or series of broadcasts for a specific purpose

## **Integrated outcomes that can be addressed in this module**

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Grade 11 students will be expected to

- 1.1 demonstrate an understanding of the history of communication
- 1.2 investigate their strengths related to career options in communications technology
- 1.3 generate a professional portfolio representing a collection of work completed throughout the course using the design process
- 1.4 determine and create solutions to design problems that can persuade or entertain an audience using a variety of electronic communications tools
- 1.5 demonstrate an understanding of the social and environmental impacts of communications technology
- 1.6 demonstrate an understanding of life-cycle analysis of modern communications equipment and processes
- 1.7 demonstrate safe practices when using communications technology tools and equipment

Grade 12 students will be expected to

- 1.8 investigate modern and future forms of communication and predict futuristic career options in communications technology
- 1.9 generate a digital professional portfolio representing a collection of advanced work completed throughout the course using the design process
- 1.10 design, create, and transport solutions to design problems that can entertain a variety of target audiences using a variety of electronic communications tools
- 1.11 examine and analyse solutions to communications technology problems
- 1.12 create a design improvement to the life-cycle analysis of an electronic communication device
- 1.13 establish a safe practice policy for one or more communication technology processes within the classroom laboratory

**GCO: Students will be expected to design, develop, evaluate, and articulate technological solutions.**

## Outcomes

Grade 11 students will be expected to

- 7.1 practice using different modalities and applications of broadcasting through various roles within a broadcast studio
- 7.2 identify broadcasting equipment and the various range of broadcast signals
- 7.3 produce a broadcast for a specific purpose
- 7.4 practice journalism story form to broadcast a message

Grade 12 students will be expected to

- 7.6 demonstrate an understanding of how satellite technology affects them
- 7.7 communicate a message through script writing for specific broadcasting applications
- 7.8 demonstrate an understanding of broadcasting frequencies and bandwidth
- 7.9 use and operate broadcasting equipment to produce a broadcast or series of broadcasts for a specific purpose

## Suggestions for Assessment

Refer to page 14, [The Assessment Process](#), before beginning the suggested activities with students.

As students begin to solve design problems, they should record their work in their professional portfolio. They can choose to make it available for viewing or not, but it can all be accessed from the portfolio.

### Design Problem Activity Ideas

Students can create solutions to design problems such as:

#### MUSICAL BELLS

Replace the industrial dehumanizing tones that move teachers and students from class to class with a friendlier alternative by broadcasting musical bells. An old laptop, an alarm clock program and iTunes all patched into the school PA system and you are ready to start the day with a song and move from class to class with something different. You can have a different version of *Oh Canada* every day, recordings made by the school band or student bands from within the school. Using GarageBand or Audacity, students can create six-second or longer "songs" to signal the change of classes.

**Note:** Under the "Fair Use" agreement, even short clips from commercial music can be used. Full length songs may be acceptable before first period and at the end of the lunch period.

### **MUSICAL STORIES**

In GarageBand or Audacity, students create audio stories requiring a beginning, middle, and an end, from the sound effects and loops available in software or from websites where sounds can be downloaded. The story should communicate a specific message the student wants to convey.

### **THE PHOTO ESSAY**

Each student selects a topic on which to create a photographic essay. Pictures are selected, cropped, sized and printed—or even mounted on cardboard for display. Students use photography skills and software to manage their assets and broadcast a message. Creativity is evident in the way the pictures are arranged and displayed, communicating the message effectively.

### **OTHER ACTIVITY IDEAS**

- Take a newspaper story and turn it into a broadcast working as a team.
- Create a lock-down procedure video for students outlining exits and entrances for emergency responders and broadcast it to the school.
- Translate a print story into a visual story using photography or video.
- Cover a student event and broadcast it.
- Create a call-in show. Put in a commercial and a jingle, script it, add five or six recorded song clips or promo them using a ten-second clip, "Coming up Next."
- Conduct and edit an interview of a student at a school competitive event for a broadcast.
- Create an advertisement and broadcast it internally.

# Suggestions for Learning and Teaching

Students can

- work as a team to create sound and lighting to enhance a broadcast
- complete a wiring activity to practice independence with wiring broadcasting equipment

Teachers can

- provide examples of types and patterns of microphones and appropriate uses
- provide instruction on frequencies (radio) and bandwidth (computing)
- do a concept map with students to categorize broadcast projects
- provide instruction about media literacy
- teach students how to use a microphone, a sound mixer, video equipment, a recording device, and editing mechanisms, where appropriate
- provide instruction on analog versus digital broadcasting
- work with students to establish safety rules and regulations with broadcasting equipment and processes
- provide instruction on frequencies and bandwidth issues—tone control (voice on phone versus music speakers; equalization)
- provide instruction on the different modalities of broadcasting
- provide instruction on wiring equipment for broadcasting purposes
- provide instruction on interviewing skills

## Notes

- Written permissions are usually required when students are involved in broadcasting.
- Free radio automation software (<http://www.mixtime.com>)
- News broadcasts can happen within a class and can broadcast to a closed audience.
- TV colours: RGB (red/green/blue)
- Web colours: CMYK (cyan/magenta/yellow/black)
- Audio recording using Audacity, Garage Band, Cubase ([audacity.sourceforge.net](http://audacity.sourceforge.net), [www.apple.com/ilife/garageband](http://www.apple.com/ilife/garageband), [steinbergnorthamerica.com/software/cubase-5](http://steinbergnorthamerica.com/software/cubase-5))



# Module 8: Animation

## Module Overview

The Animation module introduces the concept of motion graphics. Students should be encouraged to represent their knowledge in a variety of modes such as stop-time animation or digital animation. Planning is an important part of designing animated objects so storyboarding is introduced.

## Module Outcomes

Grade 11 students will be expected to

- 8.1 demonstrate an understanding of storyboarding techniques for animation
- 8.2 demonstrate an understanding of the fundamentals of sequencing moving digital images
- 8.3 create an animation that has a purpose and message

Grade 12 students will be expected to

- 8.4 create a storyboard to plan and communicate an animation sequence
- 8.5 create a two-dimensional (2-D) or three-dimensional (3-D) digital animation that has a purpose and message
- 8.6 insert sound into a digital animation

### **Integrated outcomes that can be addressed in this module**

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Grade 11 students will be expected to

- 1.1 demonstrate an understanding of the history of communication
- 1.2 investigate their strengths related to career options in communications technology
- 1.3 generate a professional portfolio representing a collection of work completed throughout the course using the design process
- 1.4 determine and create solutions to design problems that can persuade or entertain an audience using a variety of electronic communications tools
- 1.5 demonstrate an understanding of the social and environmental impacts of communications technology
- 1.6 demonstrate an understanding of life-cycle analysis of modern communications equipment and processes
- 1.7 demonstrate safe practices when using communications technology tools and equipment

Grade 12 students will be expected to

- 1.8 investigate modern and future forms of communication and predict futuristic career options in communications technology
- 1.9 generate a digital professional portfolio representing a collection of advanced work completed throughout the course using the design process
- 1.10 design, create, and transport solutions to design problems that can entertain a variety of target audiences using a variety of electronic communications tools
- 1.11 examine and analyse solutions to communications technology problems
- 1.12 create a design improvement to the life-cycle analysis of an electronic communication device
- 1.13 establish a safe practice policy for one or more communication technology processes within the classroom laboratory



**GCO: Students will be expected to design, develop, evaluate, and articulate technological solutions.**

## Outcomes

Grade 11 students will be expected to

- 8.1 demonstrate an understanding of storyboarding techniques for animation
- 8.2 demonstrate an understanding of the fundamentals of sequencing moving digital images
- 8.3 create an animation that has a purpose and message

Grade 12 students will be expected to

- 8.4 create a storyboard to plan and communicate an animation sequence
- 8.5 create a two-dimensional (2-D) or three-dimensional (3-D) digital animation that has a purpose and message
- 8.6 insert sound into a digital animation

## Suggestions for Assessment

Refer to page 14, [The Assessment Process](#), before beginning the suggested activities with students.

As students begin to solve design problems, they should record their work in their professional portfolio. They can choose to make it available for viewing or not, but it can all be accessed from the portfolio.

### Design Problem Activity Ideas

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Students can create solutions to design problems such as:

- An animated storybook for special needs students within the school using any software that will allow for moving objects on a timed basis
- Title for a movie or webpage
- Animated text as a title for a presentation
- Create a claymation
- Use an existing animation to create a storyboard
- Plan an authentic animation by creating a storyboard

## Suggestions for Learning and Teaching

Students can

- practice the following techniques:
  - moving images
  - stop frame animation
  - motion tweening
- create a flip book
- timing (frames per second)

Teachers can

- teach the basic concepts of creating an animated object
- apply historical contexts
- provide instruction or tutorials on keyframing, tweening, timing

## Notes

- Time Stopper ([timestopper.yolasite.com/download.php](http://timestopper.yolasite.com/download.php))
- iStopMotion (i.e., claymation) ([boinx.com/istopmotion/overview](http://boinx.com/istopmotion/overview))
- Adobe Flash Player (shockwave files) ([www.adobe.com/products/flashplayer](http://www.adobe.com/products/flashplayer))

# Contexts for Learning and Teaching

## Principles of Learning

The public school program is based on principles of learning that teachers and administrators should use as the basis of the experiences they plan for their students. These principles include the following:

### **1. Learning is a process of actively constructing knowledge.**

Therefore, teachers and administrators have a responsibility to

- create environments and plan experiences that foster inquiry, questioning, predicting, exploring, collecting, educational play, and communicating
- engage learners in experiences that encourage their personal construction of knowledge, for example, hands-on science and math, drama, creative movement, artistic representation, and writing and talking learning activities
- provide learners with experiences that actively involve them and are personally meaningful

### **2. Students construct knowledge and make it meaningful in terms of their prior knowledge and experiences.**

Therefore, teachers and administrators have a responsibility to

- find out what students already know and can do
- create learning environments and plan experiences that build on learners' prior knowledge
- ensure that learners are able to see themselves reflected in the learning materials used in the school
- recognize, value, and use the great diversity of experiences and information students bring to school
- provide learning opportunities that respect and support students' racial, cultural, and social identities
- ensure that students are invited or challenged to build on prior knowledge, integrating new understandings with existing understandings

**3. Learning is enhanced when it takes place in a social and collaborative environment.**

Therefore, teachers and administrators have a responsibility to

- ensure that talk, group work, and collaborative ventures are central to class activities
- see that learners have frequent opportunities to learn from and with others
- structure opportunities for learners to engage in diverse social interactions with peers and adults
- help students to see themselves as members of a community of learners

**4. Students need to continue to view learning as an integrated whole.**

Therefore, teachers and administrators have a responsibility to

- plan opportunities to help students make connections across the curriculum and with the world outside and structure activities that require students to reflect on those connections
- invite students to apply strategies from across the curriculum to solve problems in real situations

**5. Learners must see themselves as capable and successful.**

Therefore, teachers and administrators have a responsibility to

- provide activities, resources, and challenges that are developmentally appropriate to the learner
- communicate high expectations for achievement to all students
- encourage risk taking in learning
- ensure that all students experience genuine success on a regular basis
- value experimentation and treat approximation as signs of growth
- provide frequent opportunities for students to reflect on and describe what they know and can do
- provide learning experiences and resources that reflect the diversity of the local and global community
- provide learning opportunities that develop self-esteem

**6. Learners have different ways of knowing and representing knowledge.**

Therefore, teachers and administrators have a responsibility to

- recognize each learner's preferred ways of constructing meaning and provide opportunities for exploring alternative ways
- plan a wide variety of open-ended experiences and assessment strategies
- recognize, acknowledge, and build on students' diverse ways of knowing and representing their knowledge
- structure frequent opportunities for students to use various art forms—music, drama, visual arts, dance, movement, crafts—as a means of exploring, formulating, and expressing ideas

## 7. Reflection is an integral part of learning.

Therefore, teachers and administrators have a responsibility to

- challenge their beliefs and practices based on continuous reflection
- reflect on their own learning processes and experiences
- encourage students to reflect on their learning processes and experiences
- encourage students to acknowledge and articulate their learning
- help students use their reflections to understand themselves as learners, make connections with other learning, and proceed with learning

## Learning Styles and Needs

Learners have many ways of learning, knowing, understanding, and creating meaning. Research into links between learning styles and preferences and the physiology and function of the brain has provided educators with a number of helpful concepts of and models for learning. Howard Gardner, for example, identifies eight broad frames of mind or intelligences: linguistic, logical/ mathematical, visual/spatial, body/kinesthetic, musical, interpersonal, intrapersonal, and naturalistic. Gardner believes that each learner has a unique combination of strengths and weaknesses in these eight areas, but that the intelligence can be more fully developed through diverse learning experiences. Other researchers and education psychologists use different models to describe and organize learning preferences.

Students' ability to learn is also influenced by individual preferences and needs within a range of environmental factors, including light, temperature, sound levels, availability of food and water, proximity to others, opportunities to move around, and time of day.

How students receive and process information and the ways they interact with peers and their environment in specific contexts are both indicators and shapers of their preferred learning styles. Most learners have a preferred learning style, depending on the situation and the type and form of information the student is dealing with, just as most teachers have a preferred teaching style, depending on the context. By reflecting on their own styles and preferences as learners and as teachers in various contexts, teachers can

- build on their own teaching-style strengths
- develop awareness of and expertise in a number of learning and teaching styles and preferences
- identify and allow for differences in student learning styles and preferences
- identify and allow for the needs of students for whom the range of ways of learning is limited
- organize learning experiences to accommodate the range of ways in which students learn

Learning experiences and resources that engage students' multiple ways of understanding allow them to become aware of and reflect on their learning processes and preferences. To enhance their opportunities for success, students need

- a variety of learning experiences to accommodate their diverse learning styles and preferences
- opportunities to reflect on their preferences and the preferences of others to understand how they learn best and how others learn differently
- opportunities to explore, apply, and experiment with learning styles other than those they prefer, in learning contexts that encourage risk taking
- opportunities to return to preferred learning styles at critical stages in their learning
- opportunities to reflect on other factors that affect their learning, for example, environmental, emotional, sociological, cultural, and physical factors
- a flexible time line within which to complete their work

## Meeting the Needs of All Students

Learners require inclusive classrooms, where a wide variety of learning experiences ensure that all students have equitable opportunities to reach their potential.

In designing learning experiences, teachers must accommodate the learning needs, preferences, and strengths of individuals, and consider the abilities, experiences, interests, and values that they bring to the classroom. In recognizing and valuing the diversity of students, teachers should consider ways to

- create a climate and design learning experiences to affirm the dignity and worth of all learners in the classroom community
- consider the social and economic situations of all learners
- acknowledge racial and cultural uniqueness
- model the use of inclusive language, attitudes, and actions supportive of all learners
- adapt classroom organization, teaching strategies, assessment practices, time, and learning resources to address learners' needs and build on their strengths
- provide opportunities for learners to work in a variety of contexts, including mixed-ability groupings
- identify and apply strategies and resources that respond to the range of students' learning styles and preferences
- build on students' individual levels of knowledge, skills, and attitudes
- use students' strengths and abilities to motivate and support their learning
- provide opportunities for students to make choices that will broaden their access to a range of learning experiences
- acknowledge the accomplishment of learning tasks, especially those that learners believed were too challenging for them

Teachers must adapt learning contexts, including environment, strategies for learning, and strategies for assessment, to provide support and challenge for all students, using curriculum outcomes to plan learning experiences appropriate to students' individual learning needs. When these changes are not sufficient for a student to meet designated outcomes, an individual program plan may be developed. For more detailed information, see *Special Education Policy*.

A range of learning experiences, teaching and learning strategies, motivation, resources, and environments provide expanded opportunities for all learners to experience success as they work toward the achievement of designated outcomes. Many of the learning experiences suggested in this guide provide access for a wide range of learners, simultaneously emphasizing both group support and individual activity. Similarly, the suggestions for a variety of assessment practices provide multiple ways for students to demonstrate their achievements.

## The Role of Information and Communication Technology

### **Vision for the Integration of Information**

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Some of the outcomes in Communications Technology 11 and Communications Technology 12 are, by nature, technology dependent. Students need access to the information and communication technologies available in schools to facilitate learning across the curriculum and across the modules within this course.

The Nova Scotia Department of Education has articulated five strands in the learning outcomes framework for the integration of information and communication technology within Public School Programs.

**Basic Operations and Concepts:** Concepts and skills associated with the safe and efficient operation of a range of information and communication technology.

**Social, Ethical, and Human Issues:** The understanding associated with the use of information/communication technology that encourages in students a commitment to pursue personal and social good, particularly to build and improve their learning environments and to foster strong relationships with their peers and others who support their learning.

**Productivity:** The efficient selection and use of information and communication technology to perform tasks such as the exploration of ideas, data collection, data manipulation, including the discovery of patterns and relationships, problem solving, and the representation of learning.

**Communication:** Specific, interactive technology use supports student collaboration and sharing through communication.

**Research, Problem Solving, and Decision Making:** Students' organization, reasoning, and evaluation of their learning rationalize their use of information and communication technology.

## **Technological Competencies**

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Information and communication technology is the vehicle that students use to explore and evaluate the world of communication. While technological competency is certainly one of the Essential Graduation Learnings within Communications Technology 11 and Communications Technology 12, the role of technology is to facilitate the achievement of the outcomes of this course, rather than to be an end in itself. Through the use of information and communication technology, students create and design media, and learn to value, appreciate, and become critically literate participants in a technology-rich culture.

The essence of learning lies in the accessing, gathering, investigating, and managing data; problem solving; decision making; and creating and communicating new understandings in original works. If students are to understand the relationship between ideas and how they are communicated, educators need to develop high-order problem solving and decision making in their students. Students need to be able to use information and communication technology effectively for all of these purposes. Educators need to model appropriate uses of information and communication technology with their students.

Students need to develop a comfort with information and communication technology and an understanding of what medium best suits a design in order to fully utilize the power that technology offers. While information and communication technology is a tool for change, it should not become simply a tool for doing the same old thing differently. Information and communication technology enables new forms of expression.

## **The Communications Technology 11 and Communications Technology 12 Learning Environment**

### **The Classroom**

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Learning in Communications Technology 11 and Communications Technology 12 should take place, for the most part, in a computer laboratory that has space for other activities to take place, such as screen printing (and other printing or sign making methods), various types of studio sets, and space for planning. Students should have access to a printer, a scanner, digital SLR cameras, lighting equipment, and video equipment. Arranging the computers in a U-shape with the open end facing the front of the class allows the teacher to view all screens simultaneously and also allows all students clear access to the front of the room to view the teacher, data screen or board. Work benches, tables or counter space are necessary for students to carry out group work and to take notes.



## The Learning Culture

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It is important to establish a culture in the Communications Technology 11 and Communications Technology 12 laboratory where critical thinking, problem solving, and collaboration are valued and encouraged. Students should perceive the teacher as an instructor when necessary, but more frequently the teacher should be perceived as a facilitator, guiding and encouraging students throughout the feedback process as they acquire problem solving, collaboration, and technical skills. The continuous evolution of technology requires the teacher to be a lifelong learner, to apply prior knowledge, to be actively curious, and to model these qualities for students.

The role of the student in the Communications Technology 11 and Communications Technology 12 learning environment involves investigation, interpretation, collaboration, creation, and reflection. It is important that students feel comfortable discussing their ideas with others and are willing to share their opinions of others' works. Students must be willing to take risks by presenting their ideas and design solutions in a public forum. It is important that students research a design idea first and then select a technological tool to solve the problem.

By taking an active learning approach, teachers become part of the learning community and communicate to students that problem solving is a dynamic process with multiple paths to success. It is essential that students be free to collaborate and feel comfortable to take risks in their learning. Students should be encouraged to peer teach, and teachers should be comfortable learning alongside their students.



# Assessing and Evaluating Student Learning

Assessment is the systematic process of gathering information on student learning.

Evaluation is the process of analysing, reflecting upon, and summarizing assessment information, and making judgements or decisions based upon the information gathered.

The Principles of Assessment and Evaluation articulated in the document *Public School Programs* should be used as the basis of assessment and evaluation, policies, procedures, and practices.

## Effective Assessment and Evaluation Practices

Effective assessment improves the quality of learning and teaching. It can help students to become more reflective and to have control of their own learning, and it can help teachers to monitor and focus their instructional programs.

Assessment and evaluation of student learning should accommodate the complexity of learning and reflect the complexity of the curriculum. Evaluation should be based on the full range of learning outcomes towards which students have been working during the reporting period, be proportionate to the learning experiences related to each outcome, and focus on patterns of achievement as well as specific achievement.

In reflecting on the effectiveness of their assessment program, teachers should consider the extent to which their practices

- are fair in terms of the student's background or circumstances
- are integrated with learning
- provide opportunities for authentic learning
- focus on what students can do rather than on what they cannot do
- provide students with relevant, supportive feedback that helps them to shape their learning
- describe students' progress toward learning outcomes
- help them to make decisions about revising, supporting, or extending learning experiences
- support learning risk taking
- provide specific information about the processes and strategies students are using
- provide students with diverse and multiple opportunities to demonstrate their achievement
- accommodate multiple responses and a range of tasks and resources
- provide evidence of achievement in which students can take pride
- acknowledge attitudes and values as significant learning outcomes

- encourage students to reflect on their learning, and to articulate personal learning plans
- help them to make decisions about teaching strategies, learning experiences and environments, student grouping, and resources
- include students in developing, interpreting, and reporting on assessment

## Involving Students in the Assessment Process

When students are aware of the outcomes they are responsible for and the criteria by which their work will be assessed or evaluated, they can make informed decisions about the most effective ways to demonstrate what they know, are able to do, and value.

It is important that students participate actively in the assessment and evaluation of their learning, developing their own criteria and learning to judge a range of qualities in their work. Students should have access to models in the form of scoring criteria, rubrics, and work samples.

As lifelong learners, students assess their own progress, rather than relying on external measures (for example, marks) to tell them how well they are doing. Students who are empowered to assess their own progress are more likely to perceive their learning as its own reward. Rather than asking What does the teacher want?, students need to ask questions such as, What have I learned? What can I do now that I couldn't do before? What do I need to learn next?

Effective assessment practices provide opportunities for students to

- reflect on their progress toward achievement of learning outcomes
- assess and evaluate their learning
- set goals for future learning

## Diverse Learning Styles and Needs

Teachers should develop assessment practices that affirm and accommodate students' cultural and linguistic diversity. Teachers should consider patterns of social interaction, diverse learning styles, and the multiple ways oral, written, and visual language are used in different cultures for a range of purposes. Student performance takes place not only in a learning context, but in a social and cultural context as well.

Assessment practices must be fair, equitable, and without bias, providing a range of opportunities for students to demonstrate their learning. Teachers should be flexible in evaluating the learning success of students and seek diverse ways for students to demonstrate their personal best. In inclusive classrooms, students with special needs have opportunities to demonstrate their learning in their own way, using media that accommodates their needs, and at their own pace.

## Using a Variety of Assessment Strategies

When teachers make decisions about what learning to assess and evaluate, how to assess and evaluate, and how to communicate the results, they send clear messages to students and others about what learning they value; for example, teachers can communicate that they value risk taking or lateral thinking by including these elements in determining marks.

Assessment involves the use of a variety of methods to gather information about a wide range of student learning and to develop a valid and reliable snapshot of what students know and are able to do that is clear, comprehensive, and balanced. The assessment process provides information about each student's progress toward achievement of learning outcomes that teachers can use to assign marks, to initiate conversations with students, or to make decisions in planning subsequent learning experiences.

Teachers align evaluation and assessment practices with student-centred learning practices when they

- design assessment and evaluation tasks that help students make judgments about their own learning and performance
- provide assessment and evaluation tasks that allow for a variety of learning styles and preferences
- individualize assessment and evaluation tasks to accommodate specific learning needs
- work with students to describe and clarify what will be assessed and evaluated and how it will be assessed and evaluated
- provide students with regular and specific feedback on their learning

Assessment activities, tasks, and strategies include, for example,

- anecdotal records
- artifacts
- audiotapes
- checklists
- conferences
- certifications
- demonstrations
- dramatizations
- exhibitions
- rating scales
- interviews (structured or informal)
- inventories
- investigations
- learning logs or journals
- media products
- observations (structured or informal)
- peer assessments
- performance tasks
- presentations
- portfolios
- reports
- projects
- questioning
- questionnaires
- quizzes, tests, examinations
- reviews of performance
- sorting scales (rubrics)
- self-assessments
- surveys
- video

- work samples
- written assignments

## Professional Design Portfolios

Communications Technology 11 and Communications Technology 12 is a design problem-solving course. Design portfolios are a necessary part of assessing students' abilities to meet outcomes related to specific design problems and to engage students in the assessment process and allow them to participate in the evaluation of their learning.

An professional portfolio will include a selection of design work created as part of the design process throughout the course. These are most effective when they provide opportunities for students to reflect on and make decisions about their learning. The students and teacher should collaborate to make decisions about the contents of the professional portfolio for each design and to develop the criteria for evaluating the portfolio.

Portfolio assessment is especially helpful for the student who needs significant support. Teachers should use the portfolio to collaborate with the student in identifying strengths and needs, select learning experiences, and select work that best reflects the student's progress toward achievement of learning outcomes.

It is important that students share their portfolios with other students so that all students may see exemplars that represent a range of strategies for expression and levels of complexity in ideas and understanding.

Outlines and other evidence of planning, allow students to examine their progress and demonstrate achievement to teachers, parents, and others.

Students should be encouraged to incorporate their design portfolios into their "lifework portfolio," which demonstrates their achievements in a context beyond a particular course, including letters, certificates, and photographs, for example, as well as written documents.

## Tests and Examinations

Traditional tests and examinations are not, by themselves, adequate to assess student learning. The format of tests and examinations can be revised and adapted to reflect key aspects of the curriculum. Some teachers, for example, have designed tests and examinations based on collaborative or small-group learning, projects, or portfolio learning. Creating opportunities for students to collaborate on a test or examination is an effective practice in the interactive classroom, to assess learning of a higher order than recall of information, for example, learning that requires synthesis, analysis, or evaluation.

In learning activities that involve solving a design problem, for example, students might work collaboratively to clarify and define the task, and then work either collaboratively or individually to develop a solution. Students might be given a range of questions, issues, or problems, and work collaboratively to clarify their understanding of the assignments and plan responses in preparation for the examination for which only one of the questions, issues, or problems will be assigned.

The initial list of questions, issues, or problems can be developed by the teacher, negotiated by the teacher with students, or developed by students and screened by the teacher.

Process-based tests and examinations allow students to demonstrate knowledge and skills and apply strategies at multiple stages in learning processes, for example, in identifying problems, challenges, and opportunities; gathering, evaluating, and synthesizing information; generating options; and developing and evaluating solutions.

Traditional tests and examinations may present a number of problems in scheduling and resource allocation. Process-based tests and examinations may be undertaken in steps during several class periods over a number of days. Students have opportunities to revise, reflect on, and extend their knowledge and understanding. Teachers have opportunities to develop comprehensive assessments, to monitor and evaluate learning at multiple points in a process, and to use time flexibly.

## **Certification Simulation**

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In some courses, students will need to prepare to demonstrate their learning through entrance tests and examinations, or to obtain or upgrade a certification (such as Electricians or Chartered Accountants). Replicating this type of assessment in the classroom can help students prepare for the conditions and assessment formats they may encounter in workplace and post-secondary situations.

To make this kind of assessment an effective learning experience, teachers should define a specific context and purpose, for example, the operation of a device, the identification of materials, labels, or the demonstration of a technique or procedure.





# Appendices



# Appendix A: Career Search Report

<p>Student:</p> <p>Module:</p> <p>Pre-search ideas about this career:</p>	<p>Date:</p> <p>Career Search Title:</p> <p>Careers found within the search:</p>
<p>Post-search ideas about this career:</p>	<p>What did you discover about yourself after doing this search?</p>

## Appendix B: SLR Camera Basics

Shutter speed and aperture are inversely related on a 1:1 ratio. In other words, to just keep the same exposure of light for a picture. This will be explained later. If you increase the shutter speed one faster speed (and each is a doubling, e.g., 125 to 250, so actually half as much light enters) then you would have to (a) open the aperture one step (e.g., f 8 to f 5.6), which will double the amount of light entering as the numbers get smaller; or (b) set the ISO speed rating a step higher, for example, from 100 to 200.

### Here Are the Limits

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You cannot hold a camera steady enough for a good picture below approximately 1/50 of a second. (You need a tripod). If you are in a museum and brace yourself, you might go down to 1/30 second. Any kind of subject movement means the ISO speed rating must be at least 1/60 seconds (unless you want the blurred look). Within reason, the slower the shutter speed (lots of light) means the smaller the diameter of your aperture (e.g., 8 or 11). Why do you want a small aperture? Because the smaller the aperture (f 8 to f 11) the more of your photo will be in focus (i.e., depth of focus increases as aperture size decreases).

If you want a more cinematic effect of shallow depth of focus, you want the aperture open as much as possible (f 1.2), and then raise the shutter speed to get the proper exposure. Focus will be important. A moving subject will easily go out of focus.

### Problems

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#### 1. NOT ENOUGH LIGHT FOR A GOOD EXPOSURE.

Even though the aperture is at 1.2 and the shutter speed is down to 1/45 sec. (You need a tripod for this.)

**Simple answer:** Set the camera to AUTO everything and turn on the flash.

**Clever answer:** (or when Flash is prohibited) You can fool the camera by raising the sensitivity of the "film" to light, (i.e., the ISO number). Normal ISO is 100–200. You can usually raise it on manual cameras. Some will go to 1600. It is like having five more steps in your aperture or shutter speed. The penalty is that if there is not really enough light to properly expose the element, then there will be "film grain" or digital noise. But at least you will have a picture.

**2. Too MUCH LIGHT.**

**Answer:** Use ND (neutral density) filter settings to reduce overall light entering.

**Answer:** Decrease the ISO as low as possible, probably 100, increase shutter speed, decrease aperture to 11.

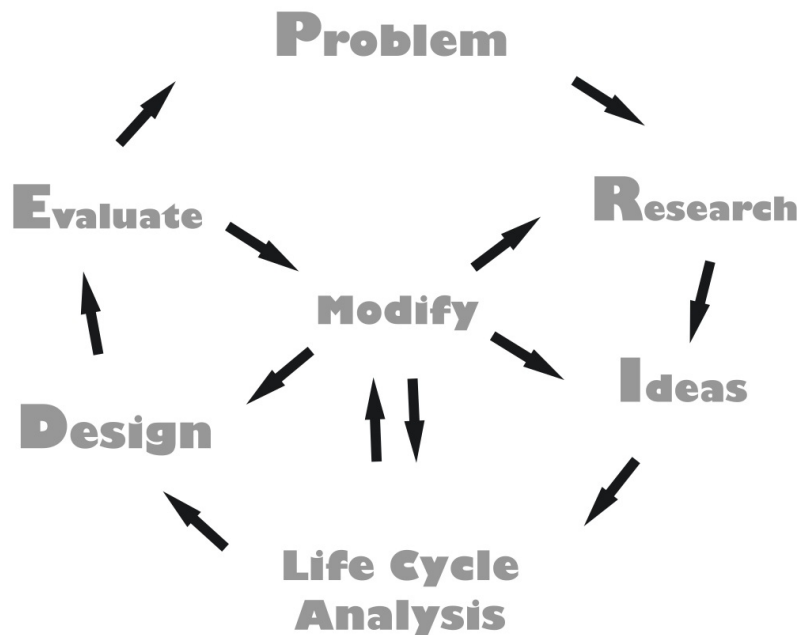
All the above assumes you can find and use the exposure level meter in the viewfinder of the LCD.

When you are not in a hurry, shooting manual is the most fun. You will know what you are getting. And digital is great because you get instant feedback.

## Appendix C: The (Green) Design Process

1. Identify the problem.
2. Conduct some research (seek examples, ask and answer questions)
3. Generate lots of ideas (make notes, sketch samples, create storyboards or site maps)
4. Consider the "Life Cycle Analysis" of this design or product.
  - Where did it come from and what was involved in getting or making it?
  - What is it being used for now?
  - How will it be used in the future and where will it or its parts go at the end of its life?
5. Create a design or build the prototype.
6. Evaluate it or test it out to see if it solves the problem.
7. Go back and modify it. Perhaps this is done to improve the life cycle or just the design itself.
8. Re-evaluate.

### The Green Design Process



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## Appendix D: Life-Cycle Analysis

Life-Cycle Analysis is the life cycle of a product from before the point of origin of all of its parts until after it is completely finished its usefulness. The concept of life-cycle analysis involves having humans consider all consequences of every stage of creating a particular product; the consequences of getting it, using it, and the ultimate destination of that product and its parts; and the consequences of destroying it or not.

Life-cycle analysis takes into consideration the social, economic, and environmental impacts of obtaining the components of a product, the manufacturing process involved in making the product, and the destruction of the product. The social, economic, and environmental considerations are not always balanced, but will always be impacted in some way through the development of any product.

Ultimately, designing products with life cycle in mind will consider the impacts to society, the environment, and the economy at all stages of the development, use, and end of the life of a product so that better design will allow for the components used in products can be easily and safely re-entered into the manufacturing system.





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# Resources

## Print Resources

### ALR Resources

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*The Non-Designer's Web Book* (NSSBB# 25264)

*The Non-Designer's Design Book* (NSSBB # 25265)

*Making Classroom Assessment Work*, Second Edition (NSSBB# 18637)

### Other Print Resources

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Atlantic Provinces Education Foundation. *Foundation for the Atlantic Canada Technology Education Curriculum*. Halifax, NS: Atlantic Provinces Education Foundation, 2001. (ISBN: 1895669618)

International Technology Education Association and its Technology for All Americans Project. *Standards for Technological Literacy: Content for the Study of Technology*, Third Edition. Reston, VA: International Technology Education Association, 2007. (ISBN: 1877101020)  
([iteaconnect.org/TAA/PDFs/xstnd.pdf](http://iteaconnect.org/TAA/PDFs/xstnd.pdf))

McDonough, William, and Michael Braungart. *Cradle to Cradle: Remaking the Way We Make Things*. [n.p.]: North Point Press, 2002. (ISBN: 9780865475878)

## Websites

### Graphic Design

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Merx Equity's Creative Design Studio  
[www.brochure-designing.net/creativetalk](http://www.brochure-designing.net/creativetalk)

### Career Planning

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About.com: Career Planning  
[careerplanning.about.com](http://careerplanning.about.com)

Youth Canada: Career Planning  
[www.youth.gc.ca/eng/topics/career\\_planning/index.shtml](http://www.youth.gc.ca/eng/topics/career_planning/index.shtml)

## Additional websites

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21Classes Cooperative Learning (blog site for students)

[21classes.com](http://21classes.com)

3dRender.com, Three-Point Lighting for 3D Rendering

[3drender.com/light/3point](http://3drender.com/light/3point)

4Teachers.org, Teach with Technology

[www.4teachers.org](http://www.4teachers.org)

Adbusters, Print Ad ([adbusters.org/spoofads/printad](http://adbusters.org/spoofads/printad))

Atomic Learning

[atomiclearning.com](http://atomiclearning.com)

Canon Digital Learning Center

[usa.canon.com/dlc/controller?act=TipsAndTechsAct](http://usa.canon.com/dlc/controller?act=TipsAndTechsAct)

Concept Development Site Map

[plocktau.com/how-tos/web\\_development/web\\_development\\_101\\_sitemap.gif](http://plocktau.com/how-tos/web_development/web_development_101_sitemap.gif)

Creative Cow.net: Creative Communities of the World

<http://forums.creativecow.net/>

David Dahms, Lens Focal Length

[paragon-press.com/lens/lenchart.htm](http://paragon-press.com/lens/lenchart.htm)

Digital Photography School

[digital-photography-school.com](http://digital-photography-school.com)

Digital Photography School, Digital Photography Composition Tips

[digital-photography-school.com/digital-photography-composition-tips](http://digital-photography-school.com/digital-photography-composition-tips)

Digital Photography School, Rule of Thirds

[digital-photography-school.com/rule-of-thirds](http://digital-photography-school.com/rule-of-thirds)

Digital Photography School, Six Tips for Perfect Composition in Portrait Photography

[digital-photography-school.com/6-tips-for-perfect-composition-in-portrait-photography#](http://digital-photography-school.com/6-tips-for-perfect-composition-in-portrait-photography#)

Media College.com

[www.mediacollege.com](http://www.mediacollege.com)

Megapixel Calculator—Digital Camera Resolution

[web.forret.com/tools/megapixel.asp?width=640&height=480](http://web.forret.com/tools/megapixel.asp?width=640&height=480)

Nova Scotia Community College Program and Course Selection

[nsc.ca/Learning\\_Programs/Programs/default.aspx](http://nsc.ca/Learning_Programs/Programs/default.aspx)

Nova Scotia Community College, Graphic Design course information

[nsc.ca/Learning\\_Programs/Programs/PlanDescr.aspx?prg=GRDE&pln=GRAPHDES](http://nsc.ca/Learning_Programs/Programs/PlanDescr.aspx?prg=GRDE&pln=GRAPHDES)

Nvu (free web-authoring system)

[net2.com/nvu/](http://net2.com/nvu/)

picso

[pics-o.com](http://pics-o.com)

Photoflex Lighting School

[www.photoflexlightingschool.com/Lighting\\_Lessons/index.html](http://www.photoflexlightingschool.com/Lighting_Lessons/index.html)

ProudPhotography.com, online photography course

[proudphotography.com/#](http://proudphotography.com/#)

RubiStar (rubric builder)

[rubistar.4teachers.org](http://rubistar.4teachers.org)

Service Canada Job Bank

[jobsetc.gc.ca/toolbox/quizzes/quizzes\\_home.do](http://jobsetc.gc.ca/toolbox/quizzes/quizzes_home.do)

Teachnet.ie: Creating Your Photostory

[teachnet.ie/innovative\\_teacher/default.asp?NCID=365](http://teachnet.ie/innovative_teacher/default.asp?NCID=365)

Web Designer Forum

[webdesignerforum.co.uk](http://webdesignerforum.co.uk)

## Software

Adobe Kuler

[adobe.com/products/kuler](http://adobe.com/products/kuler)

Adobe Flash Player (shockwave files)

[www.adobe.com/products/flashplayer](http://www.adobe.com/products/flashplayer)

Aperture

[www.apple.com/aperture](http://www.apple.com/aperture)

Audacity

[audacity.sourceforge.net](http://audacity.sourceforge.net)

Comic Life

[comiclifecom.com](http://comiclifecom.com)

Cubase

[steinbergnorthamerica.com/software/cubase-5](http://steinbergnorthamerica.com/software/cubase-5)

Google SketchUp

[sketchup.google.com](http://sketchup.google.com)

Garage Band

[www.apple.com/ilife/garageband](http://www.apple.com/ilife/garageband)

iPhoto

[www.apple.com/ilife/iphoto](http://www.apple.com/ilife/iphoto)

iStopMotion (i.e., claymation)

[boinx.com/istopmotion/overview](http://boinx.com/istopmotion/overview)

Microsoft Paint (Microsoft Windows operating system)

Music Software:

- iTunes ([www.apple.com/itunes](http://www.apple.com/itunes))
- Alarm Clock ([download.cnet.com/Alarm-Clock/3000-2350\\_4-10064069.html](http://download.cnet.com/Alarm-Clock/3000-2350_4-10064069.html))
- Mixtime.com, (free radio software) ([www.mixtime.com](http://www.mixtime.com))

Photo editing software (free downloads):

- Picasa ([picasa.google.ca](http://picasa.google.ca)) (for PC)
- Picasa ([picasa.google.com/mac](http://picasa.google.com/mac)) (for Mac)
- Paint.net ([paint.net](http://paint.net))
- Pixa.com ([pixa.com](http://pixa.com))

Time Stopper

[timestopper.yolasite.com/download.php](http://timestopper.yolasite.com/download.php)