APPENDIX B2

COMPUTER SCIENCE PROGRAM

1. Accord Computer Science Syllabus
2. Accord Computer Science Curriculum
3. Accord Computer Science Guidelines
4. Computer Literacy 6th Grade Curriculum
5. Computer Literacy 7th Grade Curriculum
6. 8th Grade Curriculum
7. Introduction to Programming Annual Plan
8. Introduction to Programming Guidelines
9. Digital Arts Curriculum
10. Digital Arts Guidelines
11. Web Authoring Curriculum
12. Web Authoring Guidelines
13. Desktop Publishing Model
14. Introduction to Digital Design

Computer Science A

2007 - 2008

Brief Description of Course

AP Computer Science A is a both college-prep course for potential computer science majors and a foundation course for students planning to study in other technical fields such as engineering, physics. Computer Science A emphasizes object-oriented programming methodology with a concentration on problem solving and algorithm development and is meant to be the equivalent of a first-semester college-level course in Computer Science. It also includes the study of data structures, design, abstraction. The following plan goes week by week through the school year. Computing Concepts with Java Essentials is a primary sourse. AP Computer Science Exam in Java is a secondary book we will use for example tests.

Unit Information

Unit Name or Timeframe:
Week 1
Inroduction to the concept of objects

Content and/or Skills Taught:
To understand object (class, instance, state , behavior, etc.)
Learn to use an editor Java Creator and how to compiler by entering the "Hello World" program.

Major Assignments and/or Assessments:
Reading
Horstmann, Chapter 1;
Review Exercises R1-R14

Unit Name or Timeframe:
Week 2
Inroduction to Hardware and Software

Content and/or Skills Taught:
to learn concept of Computer hardware and software

Major Assignments and/or Assessments:
2 pages research paper Computer Hardware and Software

Unit Name or Timeframe:
Week 3
Working Numbers (Primitive types)

Content and/or Skills Taught:
Introduce the primitive types (int , double, and variables, constant and the assignment statement)
Teach students to use meaningful identifiers and lower and upper case letters to distinguish between variables and methods, classes and constants.

Major Assignments and/or Assessments:
Reading
Chapter 3
Do Practice Questions pp 47-54

Unit Name or Timeframe:
Week 4
Decisions (if - else)

Content and/or Skills Taught:
to learn if statement , nested if , equal method == operator.
to learn how to use switch
to learn evaluating boolean expressions

Major Assignments and/or Assessments:
Reading
Cpater 5
Practice questions 65 - 72
pp 222-224 P 5.1 , P 5.2 , P 5.8

Unit Name or Timeframe:
Week 5
Iteration (Loops)

Content and/or Skills Taught:
to use while and for loops.

Major Assignments and/or Assessments:
Reading
Chapter 6
Do exercises pp 273-274

Unit Name or Timeframe:
Week 6
Reading data from users and randomization
Week 7 - 8
Designing classes
Week 9-10
Testing and Debugging

Content and/or Skills Taught:
Student will learn a way to read user input.
Coupling, cohesion, accessor and mutator method, static method and packages.
Introduce the concept of testing and debugging.

Major Assignments and/or Assessments:
Reading
Chapter 6- 7-8
Do exercises pp 275-276
pp 325-326
MBS Quiz Chapter 2

Unit Name or Timeframe:
Week 11
Interfaces and Polymorphism
Week 12 -13
Marine Biology Simulation
Week 14-15
Inroduction to inheritance

Content and/or Skills Taught:
Students will learn reusable code , extending a class and defining an interface.
Students will learn dynamic Fish class for Marine Biology Simulation

Major Assignments and/or Assessments:
MBS Chapter 3
Analysis questions
Read Chapter 11 pp 430-449
Test on MBS Chapter 3

Unit Name or Timeframe:
Week 16 -17-18
Introduction to Array
Week 19-20
Recursion
Week 21
MBS

Content and/or Skills Taught:
Students will learn ArrayList class nad simple algorithms for inserting and removing elements.

Major Assignments and/or Assessments:
Reading
Chapter 13-14
pp 549-550
pp 221-227

Unit Name or Timeframe:
Week 22-23
Searching and sorting
Week 24-25
Recursive searches and sorts
Week 26-27
Exceptions

Content and/or Skills Taught:
Introduce the Sequential Search.
to learn selection sort.
to learn binary search and insertion sort
to learn common exception

Major Assignments and/or Assessments:
Reading
Chapter 18
Practice Questions
pp 249 - 261
pp 238-240 , 246-248
TEST

Unit Name or Timeframe:
Week 28-29
System Design
GUI
Week 30
MBS
Week 31-33
Review for Exam
Week 34
Exam Week
Week 35-36
After AP Exam
some projects

Content and/or Skills Taught:
learn design process
familiar with questions and some practice exams.

Major Assignments and/or Assessments:
Chapter 13
pp 207-219

Textbooks

Title: Computing Concepts with Java Essentials

Publisher: Wiley

Published Date: 03 April, 2002

Author: Cay Horstmann

Description:

Other Course Materials

Material Type: Software

Description:
Java Creator

Additional Information

Requirement: Students must take Introduction to Computer Progra

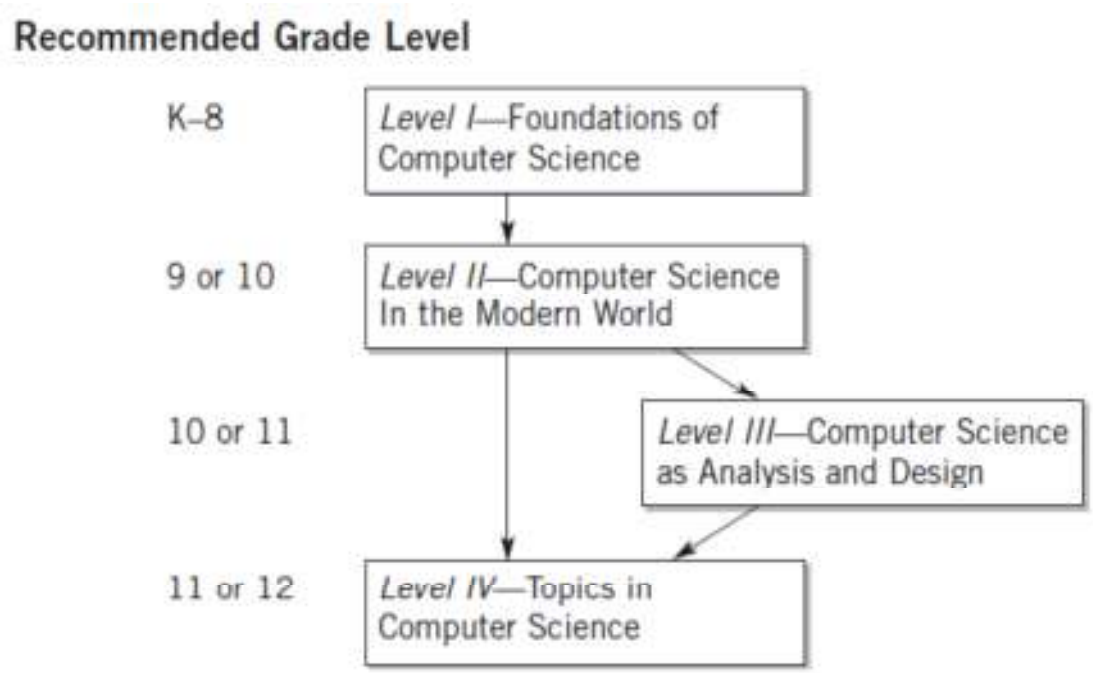
How Course Meets Requirement:

ACCORD K-12 CS CURRICULUM

COMPUTER DEPARTMENT - JUNE 8, 2012

OVERVIEW

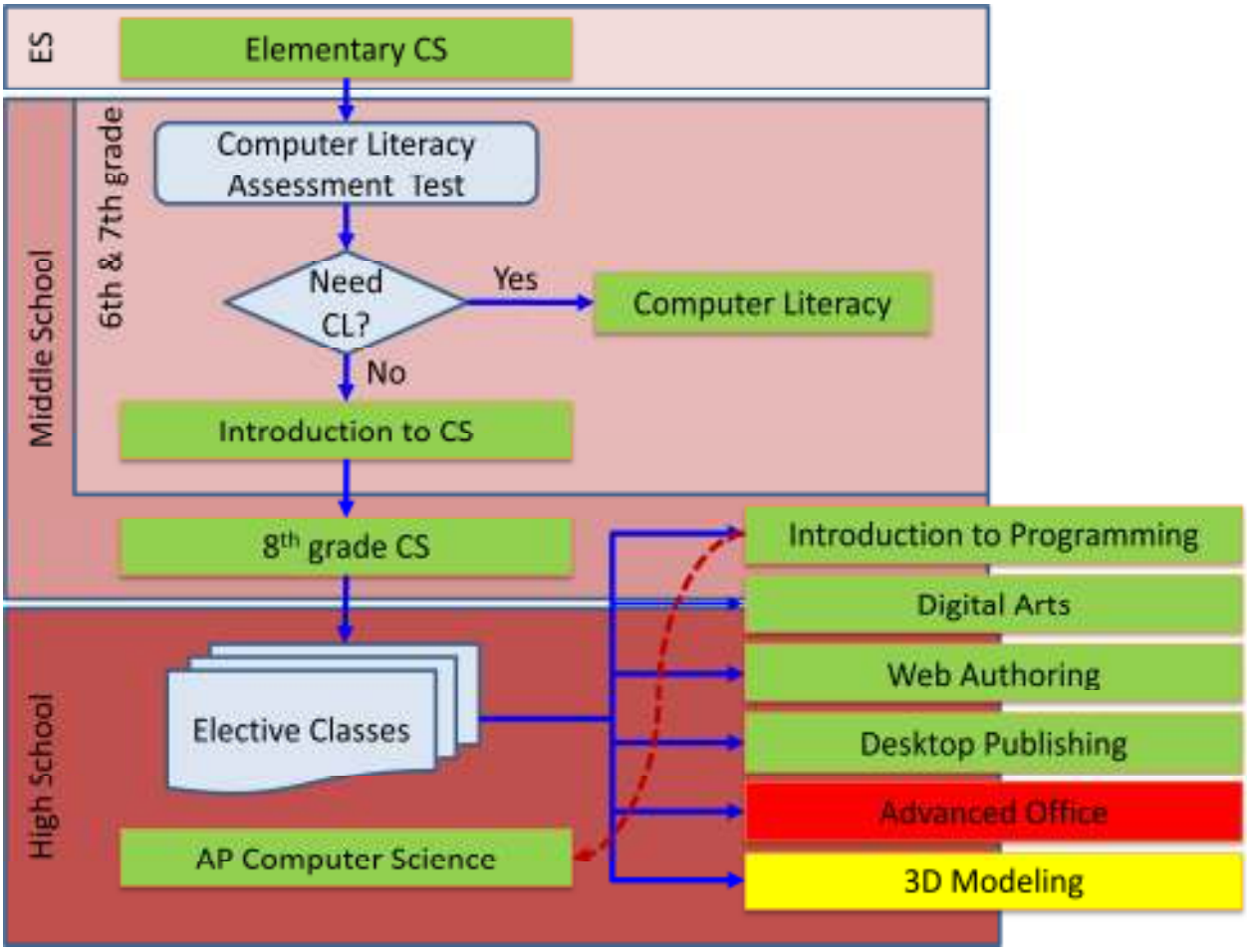
Accord Institute's Computer Science curriculum complies with Computer Science Teacher Association (CSTA)'s *A Model Curriculum for K–12 Computer Science*[1]. CSTA's model curriculum has the following levels and structure:



In fact, Accord CS Curriculum is one step ahead of the above chart. In K-8 part of the curriculum, a big portion of the Level II topics are covered in addition to the Level I topics. Level III and Level IV topics are covered in high school. For the gifted students, Accord provides advanced level problem solving packages as a part of Advanced Math and Science Program (see Middle School Section for details). AMSP CS Curriculum includes topics in Level III, IV and above.

[1] ACM K-12 CS Model Curriculum, 2nd Edition: http://csta.acm.org/Curriculum/sub/CurrFiles/K-12ModelCurr2ndEd.pdf.

Copyright© by *Accord Institute for Education Research*. All rights reserved.



The chart above summarizes Accord's K-12 CS Curriculum:

- K-5 part focuses on basic computer literacy skills as well as problem solving and creative thinking.
- Middle school part aims to provide strong skills in computer literacy and fundamentals of computational thinking. At the beginning of middle school, students are assessed on their Computer Literacy skills, and Computer Literacy level of the school is identified. Computer Literacy curriculum is compacted aligning to the school level, and Programming and Discrete Math topics are infused into the curriculum. Programming topics will be more intense in the 6th and 7th grades with the higher results in assessment exam.
- 8th grade serves a transition between middle school and high school. Hence, 8th grade topics focus on the conceptual understanding of high school electives.
- High School part has elective courses and AP Computer Science course. AP Computer Science has Introduction to Programming course as the prerequisite.

K-5

In Kindergarten and elementary school, students obtain fluency in computers and learn introductory level computer literacy. The classes are supported with problem solving and creative thinking activities.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

MIDDLE SCHOOL

Middle school CS curriculum is a flexible curriculum with respect to the Computer Literacy skills of students in a school. 6th and 7th grade topics are composed of Computer Literacy and Introduction to CS. Full Computer Literacy is designed as a two-year course, 3 hours per week for novice level students. However, the curriculum has acceleration procedures and it is compacted regarding to the Computer Literacy Assessment Exam. When the school starts, all middle school students take the exam and the school's average Computer Literacy level is determined. Then Accord Institute provides an accelerated curriculum customized for the school considering its average Computer Literacy level. The provided accelerated curriculum consists of compacted Computer Literacy topics enriched with Accord Institute's Introduction to CS course package. The students who are below the average should be supported with afterschool tutoring. Accord Institute's CStory Contest[2] is also a part of the curriculum as a motivator for the students.

Computer Literacy part of curriculum is based on International Computer Driving License (ICDL 5.0)[3] which is a renowned worldwide certification program accepted in 148 countries. It is aligned with International Society for Technology in Education's NETS standards[4].

Introduction to CS part aims to provide strong skills in computational thinking. Hence, the focus is not a structured programming language but problem solving in CS. The curriculum utilizes Scratch[5] which is the state-of-art programming language for especially K-12 kids developed by MIT Media Lab. In addition, Discrete Math topics are essential in CS education. Hence, a renowned activity based resource, CS Unplugged[6], is included in the curriculum.

AMSP is an afterschool enrichment program for the gifted students. AMSP Computer Science curriculum is focused on advanced level problem solving in CS, algorithm analysis and design. In the upper grades, USA Computing Olympiad[7], the most prestigious high school level CS competition in US, is targeted in different levels (Bronze, Silver, Gold divisions).

HIGH SCHOOL

High Schools curriculum is composed of elective courses and AP Computer Science course. Accord Institute currently provides the following elective course packages:

- Introduction to Programming
- Digital Arts
- Web Authoring
- Desktop Publishing

Elective courses can be given in any grade however the recommended sequence is as provided above. Introduction to Programming corresponds to CS Principles[8] course which is currently a pilot course and is considered as an AP course in the upcoming years. AP Computer Science requires taking Introduction to Programming course.

---

[2] CStory Contest website: http://cstory.accordeducation.org/
[3] ICDL website: http://www.ecdl.org/
[4] ISTE NETS website: http://www.iste.org/standards/nets-for-students.aspx
[5] Scratch website: http://scratch.mit.edu
[6] Website for CS unplugged resources, videos and activities: http://csunplugged.org/
[7] USACO website: http://usaco.org
[8] CS Principles course website: http://csprinciples.org/

Copyright© by *Accord Institute for Education Research*. All rights reserved.

ACCORD INSTITUTE
For Education Research

AP COMPUTER SCIENCE GUIDELINES

OBJECTIVES

The course emphasizes object-oriented programming methodology with a concentration on problem solving and algorithm development, and is meant to be the equivalent of a first-semester college-level course in computer science. It also includes the study of data structures, design, and abstraction.

PREREQUISITES

AP course has certain prerequisites:

- Teacher has to give 'Introduction to Programming' elective course before the AP course.
- Teacher must attend 1 week summer AP Computer Science workshop. It has sessions during June, July, and August. In the workshop, the teacher learns how to plan and teach the AP class. The workshop provides sufficient resources and information for the teacher. AP Courses web page is located at: http://apcentral.collegeboard.com/apc/public/courses/teachers_corner/4483.html. The registration can be done at: http://apcentral.collegeboard.com/apc/Pageflows/InstitutesAndWorkshops/InstitutesAndWorkshopsController.jpf. Choose the option 'AP Computer Science A'.
- Students must know introductory level programming, i.e., received A or B from 'Introduction to Programming' class.

LESSON PLANS

During the classes, the following style is recommended:

- Self-pace study based course
- Students follow and finish the book
- Teacher gives projects in the book
- Teacher provides previous exams

Teacher is required to prepare his/her own syllabus and submit it to the AP College Board. If it was the same as someone else's then s/he will be notified to send his/her own. Sample syllabus can be found in 'AP Computer Science-Syllabus.pdf'. Sample lesson plan can be found in the excel document '02 APCS Planner 0708.xls'. For further examples, see the folder '00 Syllabus'.

TEXTBOOK

The AP workshop provides around 20 text books and there are many AP Computer Science books available in the market. The following textbook may be used:

- Java Concepts for AP Computer Science, Cay S. Horstmann, 2007.

It is recommended to buy the classroom set of the textbook. Classroom set includes 5-6 student books, and teacher's book including the lecture materials / resources. The teacher should make sure to get the teacher resources (syllabus, slides, previous exams, student projects).

SOFTWARE

There are many different free Java compilers. Java creator is recommended as a compiler. You can download it free from: http://www.jcreator.org/download.htm.

LECTURE MATERIALS

The following materials can be found in the AP Computer Science package provided in the workshop:

- Project ideas can be found in the folders '00 Projects', '07 Student Projects'.
- Previous exams can be found in the folder '02 APCS Exams'.

The grading is based on assignments (book assignments), tests (book tests) and projects.

RESOURCES

The following materials are also provided in the AP Computer Science package:

- Quick reference for AP Computer Science necessary classes and information are in the folder '01 APCS Quick References'
- Compiler information, installation, JAR files and JavaDoc documents are in the folder '04 Compiler Info Jars JavaDocs'
- Selected documents for Object Oriented Programming are in the folder '05 Teaching OOP'
- Quality Java presentation slides are in the folder '06 Java PPTs'
- Further selected AP resources are in the folder '03 AP Resources'
- Some miscellaneous stuff including class activities can be found in 'Misc' folder

BUDGET

- AP Computer Science workshop registration: ~$600
- AP class set: ~$200-$300 (per group of 5-6 students, and including teacher edition book and resources).

6TH GRADE COMPUTER LITERACY CURRICULUM

(ALIGNED WITH ICDL CURRICULUM 5.0)

SECTION I: FUNDAMENTALS (3 WEEKS)

1. Basic Components (ICDL - 1.1 Hardware)
   - 1.1. Basic components of a computer system
     - 1.1.1. Processor, input and output devices, and data storage device
   - 1.2. Differences between digital and analog systems
     - 1.2.1. Advantages and disadvantages
   - 1.3. Input/output devices
     - 1.3.1. Keyboard, mouse (pointer devices), microphone, printer, monitor, scanner

2. Healthy Computing (ICDL - 1.4 ICT in Everyday Life)
   - 2.1. Computer addiction
     - 2.1.1. Mental, physical and social consequences
   - 2.2. Basic ergonomics to use a computer safely
     - 2.2.1. Common Repetitive Motion Injuries (RMI)
     - 2.2.2. Computer use, texting and gaming, how people get RMIs, the symptoms, how to prevent them

3. Online Ethics (ICDL – 1.6 Law)
   - 3.1. Intellectual property and the copyright laws
   - 3.2. Ethical violations
     - 3.2.1. Computer hacking, piracy, intentional virus setting, and invasion of privacy

4. Digital Drawing
   - 4.1. Drawing tools
     - 4.1.1. Pen tool
     - 4.1.2. Eraser tool
     - 4.1.3. Brush tool
     - 4.1.4. Line tool
     - 4.1.5. Shape tools

Copyright© by *Accord Institute for Education Research*. All rights reserved.

4.1.6. Paint bucket tool
4.1.7. Text tool

SECTION II: WORD PROCESSING (7 WEEKS)

1. Basic Operations (ICDL - 3.1 Using the Application)
   1.1. Basic use of a word processing program
      1.1.1. Basic file operations such as open, close, save, and print.
   1.2. Select and manipulate text
      1.2.1. Cut, copy, paste, bold, italic, and underline text using a variety of methods
   1.3. The advantages of digital media over printed media

2. Spelling and Grammar Tools (ICDL - 3.6 Prepare Outputs)
   2.1. Proper spacing techniques for digital file formats
   2.2. Correct punctuation (em/en dashes, smart quotes) in digital media
   2.3. Student learns to add super and subscript text
   2.4. Bulleted and numbered lists
   2.5. Spell checker and identification of undetected errors

3. Tab, Spacing and Alignment (ICDL - 3.3 Formatting)
   3.1. Paragraph formatting
      3.1.1. Alignment and spacing settings
      3.1.2. Font type, size, and style
      3.1.3. Paragraph columns
   3.2. Tab and indent spacing
   3.3. Table of contents

4. Margins and Layout (ICDL - 3.6 Prepare Outputs)
   4.1. Page margins
      4.1.1. Margins and indent settings
   4.2. Paper size and orientation
   4.3. Page borders
   4.4. Vertical alignment

5. Report Formatting (ICDL - 3.6 Prepare Outputs)
   5.1. Common tools to format a report
      5.1.1. Page breaks
      5.1.2. Page numbering

Copyright© by *Accord Institute for Education Research*. All rights reserved.

5.1.3. Foot/endnotes
5.1.4. Headers and footers
5.1.5. Page ruler
5.1.6. Footnotes
5.2. Concerning plagiarism and source citation
5.2.1. Cited page or bibliography
5.3. Pictures

6. Citation
6.1. Concepts of citation
6.1.1. Copyright, fair use, and permissions
6.2. Citing using the APA style
6.3. Citing using the MLA style

7. Proofreading and Correcting (ICDL - 3.6 Prepare Outputs)
7.1. Spelling errors in a spell checker
7.1.1. Punctuation errors
7.1.2. Capitalization errors
7.1.3. Homonym errors

8. Collaborative Tools
8.1. Accept and reject edits
8.2. Insert/remove comments
8.3. Track changes

SECTION III: PRESENTATION (7 WEEKS)

1. Elements and Basic Design (ICDL - 6.1 Using the Application)
1.1. Definition and uses of presentation software
1.2. Components of an electronic presentation
1.2.1. Slides
1.2.1.1. Navigating through slides
1.2.2. Design objects
1.2.2.1. Text editing and formatting
1.2.2.1.1. Add, delete, and format text on slides
1.2.2.2. Images
1.2.2.2.1. Add pictures to a presentation and modify them

Copyright© by *Accord Institute for Education Research*. All rights reserved.

1.2.2.3. Slide view

1.2.2.3.1. Add backgrounds to a presentation

1.2.2.3.2. Color palette

2. Lines, Lists, and Structure (ICDL – 6.2 Developing a Presentation, 6.3 Text, 6.5 Graphical Objects)
   - 2.1. Shapes
     - 2.1.1. Add and modify
   - 2.2. Bullet lists
     - 2.2.1. Format text into bulleted or numbered lists
   - 2.3. Slides
     - 2.3.1. Insert and duplicate slides
     - 2.3.2. Copy and paste elements in between slides

3. Effects and views (ICDL - 6.5 Graphical Objects, 6.6 Prepare Outputs)
   - 3.1. Animation
     - 3.1.1. Animation effects
       - 3.1.1.1. Adding effects to text, pictures, and other objects
     - 3.1.2. Sound effects
       - 3.1.2.1. Adding sound effects in conjunction with animation effects
     - 3.1.3. Animation order and timing
   - 3.2. Transition effects
   - 3.3. Presentation views
     - 3.3.1. Concept of layers and object grouping

4. Hyperlinks
   - 4.1. Linear and non-linear presentations
   - 4.2. Focus of a slide
   - 4.3. Hyperlinks within a single presentation

SECTION IV: WEB BROWSING (2 WEEKS)

1. Browsing Basics (ICDL - 7.1 The Internet, 7.2 Using the Browser, 7.4 Web Outputs)
   - 1.1. Characteristics of web pages and websites
     - 1.1.1. URL
     - 1.1.2. Links and navigation
   - 1.2. Browsers

Copyright© by *Accord Institute for Education Research*. All rights reserved.

1.2.1. Printing a web page
1.2.2. Download files and software from the World Wide Web

2. URLs (ICDL - 7.2 Using the Browser, 7.3 Using the Web)
   2.1. Browser-server communication
   2.2. HTML and browsers
   2.3. Components of a URL
   2.4. Basic web page error messages
   2.5. Bookmarks

3. Web Searches (ICDL – 7.3.2 Searching)
   3.1. Database for storing, sorting, and organizing information
   3.2. Search engines
      3.2.1. Search strategies
         3.2.1.1. Keyword, phrase, multi-item, and truncation search strategies

4. Validity and Sourcing (7.1.2 Security Considerations)
   4.1. Privacy issues
      4.1.1. Username and passwords
   4.2. Validity of online information
      4.2.1. Site purpose, author credentials, date of publication, and design
   4.3. Fair-use and copyright laws
      4.3.1. Citation

SECTION V: SPREADSHEETS (9 WEEKS)

1. Parts and Navigation (ICDL - 4.1 Using the Application, 4.2 Cells, 4.3 Managing Worksheets)
   1.1. Definition of spreadsheet software
      1.1.1. A tool for organizing data
   1.2. Components of a spreadsheet
      1.2.1. Rows, columns, and cells
         1.2.1.1. Insert, size, and delete rows and columns
         1.2.1.2. Entering data in individual cells
         1.2.1.3. Selecting groups of cells and entire rows and columns
   1.3. Navigate through a spreadsheet

2. Basic Formatting (ICDL – 4.4 Formulas and Functions, 4.5 Formatting)

Copyright© by *Accord Institute for Education Research*. All rights reserved.

2.1. Cell formatting
    2.1.1. Format cell data as currency.
    2.1.2. Borders and shading to a cell or group of cells.
    2.1.3. Student learns to perform cell justification and merges.
2.2. Basic functions
    2.2.1. Student learns to use the alphabetical and numerical sort functions.
    2.2.2. Student learns to use the summation function.

3. Charts and Graphs (ICDL – 4.6 Graphs)
    3.1. Spreadsheet templates
    3.2. Data reading and interpreting on charts and graphs
    3.3. Labeling charts and graphs
        3.3.1. Labeling the axes on graphs
    3.4. Modifying data and updating pre-created graphs
    3.5. Graphing multiple sets of data simultaneously

4. Formulas (ICDL – 4.4 Formulas and Functions)
    4.1. Identifying cells by their location
    4.2. Summation command
    4.3. Correlation between what is typed into a cell and what appears on the screen
    4.4. Entering formulas in cells
    4.5. Cell names in a formula to perform mathematical calculations
    4.6. Copying and pasting formulas
        4.6.1. Concept of relativity of copying and pasting formulas
        4.6.2. Absolute reference

5. Functions, Copy, and Paste (ICDL – 4.4 Formulas and Functions)
    5.1. Relativity concept of copying and pasting formulas
    5.2. Functions
        5.2.1. Cell ranges in functions
        5.2.2. Numerical formulas
            5.2.2.1. Functions for mathematical mean, minimum, and maximum

6. Layout (ICDL – 4.7 Prepare Outputs)
    6.1. Page orientation and margins
    6.2. Page numbers and header/footer
    6.3. Printing with gridlines
    6.4. Text wrapping

Copyright© by *Accord Institute for Education Research*. All rights reserved.

6.5. Navigation using scroll bars
6.6. Locking table, column, and row titles

Copyright© by *Accord Institute for Education Research*. All rights reserved.

7TH GRADE COMPUTER LITERACY CURRICULUM

(BASED ON ICDL CURRICULUM 5.0)

SECTION I: FUNDAMENTALS (2 WEEKS)

1. CONCEPTS OF INFORMATION AND COMMUNICATION TECHNOLOGY

1.1. Hardware
1.1.1. Concepts
1.1.1.1. Understand the term hardware.
1.1.1.2. Understand what a personal computer is. Distinguish between desktop, laptop (notebook), tablet PC in terms of typical users.
1.1.1.4. Know the main parts of a computer like: central processing unit (CPU), types of memory, hard disk, common input and output devices.
1.1.2. Computer Performance
1.1.2.1. Know some of the factors that impact on a computer's performance like: CPU speed, RAM size, graphics card processor and memory, the number of applications running.
1.1.4. Input, Output Devices
1.1.4.1. Identify some of the main input devices like: mouse, keyboard, trackball, scanner, touchpad, stylus, joystick, web camera (webcam), digital camera, microphone.
1.1.4.2. Know some of the main output devices like: screens/monitors, printers, speakers, headphones.
1.1.4.3. Understand some devices are both input and output devices like: touchscreens.

1.2. Software
1.2.1. Concepts
1.2.1.1. Understand the term software.
1.2.1.2. Understand what an operating system is and name some common operating systems.
1.2.1.3. Identify and know the uses of some common software applications: word processing, spreadsheet, database, presentation, e-mail, web browsing, photo editing, computer games.
1.2.1.4. Distinguish between operating systems software and applications software.

1.4. ICT in Everyday Life
1.4.4. Health
1.4.4.1. Understand the term ergonomics.
1.4.4.2. Recognize that lighting is a health factor in computer use. Be aware that use of artificial light, amount of light, direction of light are all important considerations.
1.4.4.3. Understand that correct positioning of the computer, desk and seat can help maintain a good posture.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

1.5. Security

1.5.1. Identity/Authentication

1.5.1.1. Understand that for security reasons a user name (ID) and password are needed for users to identify themselves when logging on to a computer.

1.5.3. Viruses

1.5.3.1. Understand the term computer virus.

1.5.3.2. Be aware how viruses can enter a computer system.

1.5.3.3. Know how to protect against viruses and the importance of updating antivirus software regularly.

2. USING THE COMPUTER AND MANAGING FILES

2.1. Operating System

2.1.1. First Steps

2.1.1.1. Start the computer and log on securely using a user name and password.

2.1.1.3. Shut down a non-responding application.

2.1.1.5. Use available Help functions.

2.1.2. Setup

2.1.2.2. Change the computer's desktop configuration: date & time, volume settings, desktop display options (colour settings, desktop background, screen pixel resolution, screen saver options).

2.1.2.5. Use keyboard print screen facility to capture a full screen, active window.

2.1.4. Using Windows

2.1.4.1. Identify the different parts of a window: title bar, menu bar, toolbar or ribbon, status bar, scroll bar.

2.1.4.2. Collapse, expand, restore, resize, move, close a window.

2.1.4.3. Switch between open windows.

2.2. File Management

2.2.1. Main Concepts

2.2.1.1. Understand how an operating system organizes drives, folders, files in a hierarchical structure.

2.2.1.2. Know devices used by an operating system to store files and folders like: hard disk, network drives, USB flash drive, CD-RW, DVD-RW.

2.2.2. Files and Folders

2.2.2.1. Open a window to display folder name, size, location on a drive.

2.2.2.3. Navigate to a folder, file on a drive.

2.2.2.4. Create a folder and a further subfolder.

2.2.3. Working with Files

2.2.3.6. Rename files, folders.

2.2.4. Copy, Move

2.2.4.1. Select a file, folder individually or as a group of adjacent, non-adjacent files, folders.

2.2.4.2. Copy files, folders between folders and between drives.

2.2.4.3. Move files, folders between folders and between drives.

2.2.5. Delete, Restore

2.2.5.1. Delete files, folders to the recycle bin/wastebasket/trash.

2.2.6. Searching

2.2.6.1. Use the Find tool to locate a file, folder.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

2.2.6.2. Search for files by all or part of file name, by content.
2.2.6.3. Search for files by date modified, by date created, by size.
2.2.6.4. Search for files by using wildcards: file type, first letter of file name.

2.3. Utilities
2.3.1. File Compression
2.3.1.1. Understand what file compression means.
2.3.1.2. Compress files in a folder on a drive.
2.3.1.3. Extract compressed files from a location on a drive.

SECTION II: WORD PROCESSING (8 WEEKS)

3. WORD PROCESING

3.1. Using the Application
3.1.1. Working with Documents
3.1.1.1. Open, close a word processing application. Open, close documents.
3.1.1.2. Create a new document based on default template, other available template like: memo, fax, agenda.
3.1.1.3. Save a document to a location on a drive. Save a document under another name to a location on a drive.
3.1.1.5. Switch between open documents.

3.2. Document Creation
3.2.1. Enter Text
3.2.1.2. Enter text into a document.
3.2.2. Select, Edit
3.2.2.2. Select character, word, line, sentence, paragraph, entire body text.
3.2.2.3. Edit content by entering, removing characters, words within existing text, by over typing to replace existing text.
3.2.2.4. Use a simple search command for a specific word, phrase.
3.2.2.5. Use a simple replace command for a specific word, phrase.
3.2.2.6. Copy, move text within a document, between open documents.
3.2.2.7. Delete text.
3.2.2.8. Use the undo, redo command.

3.3. Formatting
3.3.1. Text
3.3.1.1. Change text formatting: font sizes, font types.
3.3.1.2. Apply text formatting: bold, italic, underline.
3.3.1.4. Apply different colours to text.
3.3.2. Paragraphs
3.3.2.1. Create, merge paragraph(s).
3.3.2.2. Insert, remove soft carriage return (line break).
3.3.2.4. Align text left, centre, right, justified.
3.3.2.5. Indent paragraphs: left, right, first line.
3.3.2.8. Apply spacing above, below paragraphs. Apply single, 1.5 lines, double line spacing within paragraphs.
3.3.2.9. Add, remove bullets, numbers in a single level list. Switch between different standard bullet, number styles in a single level list.
3.3.2.10. Add a box border and shading/background colour to a paragraph.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

3.4. Objects

3.4.1. Table Creation

3.4.1.1. Create a table ready for data insertion.

3.4.1.2. Insert, edit data in a table.

3.4.1.3. Select rows, columns, cells, entire table.

3.4.1.4. Insert, delete, rows and columns.

3.4.2. Table Formatting

3.4.2.1. Modify column width, row height.

3.4.2.2. Modify cell border line style, width, colour.

3.4.2.3. Add shading/background colour to cells.

3.4.3. Graphical Objects

3.4.3.1. Insert an object (picture, image, chart, drawn object) to a specified location in a document.

3.4.3.2. Select an object.

3.4.3.3. Copy, move an object within a document, between open documents.

3.4.3.4. Resize, delete an object.

3.6. Prepare Outputs

3.6.1. Setup

3.6.1.1. Change document orientation: portrait, landscape. Change paper size.

3.6.1.2. Change margins of entire document, top, bottom, left, right.

3.6.1.4. Insert, delete a page break in a document.

3.6.1.5. Add, edit text in headers, footers.

3.6.1.6. Add fields in headers, footers: date, page number information, file name.

3.6.1.7. Apply automatic page numbering to a document.

3.6.2. Check and Print

3.6.2.1. Spell check a document and make changes like: correcting spelling errors, deleting repeated words.

3.6.2.2. Add words to a built-in custom dictionary using a spell checker.

3.6.2.3. Preview a document.

SECTION III: PRESENTATION (8 WEEKS)

6. PRESENTATION

6.1. Using the Application

6.1.1. Working with Presentations

6.1.1.1. Open, close a presentation application. Open, close presentations.

6.1.1.2. Create a new presentation based on default template.

6.1.1.3. Save a presentation to a location on a drive. Save a presentation under another name.

6.2. Developing a Presentation

6.2.1. Presentation Views

6.2.1.1. Understand the uses of different presentation view modes: normal view, slide sorter view, outline view, slide show view.

6.2.1.3. Change between presentation view modes: normal view, slide sorter view, slide show view.

6.2.2. Slides

6.2.2.1. Choose a different built-in slide layout for a slide.

6.2.2.2. Apply an available design template to a presentation.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

6.2.2.3. Change background colour on specific slide(s), all slides.
6.2.2.4. Add a new slide with a specific slide layout like: title slide, chart and text, bulleted list, table/spreadsheet.

6.2.3. Master Slide

6.2.3.1. Insert a graphical object (picture, image, drawn object) into a master slide. Remove a graphical object from a master slide.

6.3. Text

6.3.1. Handling Text

6.3.1.2. Enter text into a placeholder in standard, outline view.

6.3.2. Formatting

6.3.2.1. Change text formatting: font sizes, font types.
6.3.2.2. Apply text formatting: bold, italic, underline, shadow.
6.3.2.3. Apply different colours to text.
6.3.2.5. Align text: left, centre, right in a text frame.

6.3.3. Lists

6.3.3.3. Switch between the different standard bullet, number styles in a list.

6.4. Charts

6.4.1. Using Charts

6.4.1.1. Input data to create built-in charts in a presentation: column, bar, line, pie.
6.4.1.3. Change the chart type.
6.4.1.6. Change the background colour of a chart.
6.4.1.7. Change the column, bar, line, pie slice colours in a chart.

6.4.2. Organization Charts

6.4.2.1. Create an organization chart with a labelled hierarchy by using a built-in organization chart feature.
6.4.2.2. Change the hierarchical structure of an organization chart.
6.4.2.3. Add, remove co-workers, subordinates in an organization chart.

6.5. Graphical Objects

6.5.1. Insert, Manipulate

6.5.1.1. Insert a graphical object (picture, image, drawn object) into a slide.
6.5.1.3. Copy, move graphical objects, charts within the presentation, between open presentations.
6.5.1.4. Resize, delete graphical objects, charts in a presentation.
6.5.1.5. Rotate, flip a graphical object.
6.5.1.6. Align a graphical object relative to a slide: left, centre, right, top, bottom.

6.5.2. Drawing

6.5.2.1. Add different types of drawn object to a slide: line, arrow, block arrow, rectangle, square, oval, circle, text box.
6.5.2.3. Change drawn object background colour, line colour, line weight, line style.
6.5.2.4. Change arrow start style, arrow finish style.
6.5.2.5. Apply a shadow to a drawn object.
6.5.2.7. Bring a drawn object one level forward, one level backward, to the front, to the back of other drawn objects.

6.6. Prepare Outputs

6.6.1. Preparation

6.6.1.1. Add, remove transition effects between slides.
6.6.1.2. Add, remove preset animation effects for different slide elements.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

6.6.2.Check and Deliver

6.6.2.4. Start a slide show from first slide, from current slide.

SECTION IV: WEB BROWSING (2 WEEKS)

7. WEB BROWSING AND COMMUNICATION

7.2. Using the Browser

7.2.1.Navigation

7.2.1.2. Navigate backwards and forwards between previously visited web pages.

7.2.2.Bookmarks

7.2.2.1. Bookmark a web page. Delete a bookmark.

7.2.2.2. Display a bookmarked web page.

7.2.2.3. Create, delete a bookmark folder.

7.2.2.4. Add web pages to a bookmark folder.

7.3. Using the Web

7.3.2.Searching

7.3.2.1. Select a specific search engine.

7.3.2.2. Carry out a search for specific information using a keyword, phrase.

7.3.2.3. Use advanced search features to refine a search: by exact phrase, by excluding words, by date, by file format.

7.4. Web Outputs

7.4.1.Saving Files

7.4.1.1. Save a web page to a location on a drive.

7.4.1.2. Download files from a web page to a location on a drive.

7.4.1.3. Copy text, image, URL from a web page to a document.

SECTION V: SPREADSHEETS (8 WEEKS)

4. SPREADSHEETS

4.1. Using the Application

4.1.1.Working with Spreadsheets

4.1.1.1. Open, close a spreadsheet application. Open, close spreadsheets.

4.1.1.2. Create a new spreadsheet based on default template.

4.1.1.3. Save a spreadsheet to a location on a drive. Save a spreadsheet under another name to a location on a drive.

4.1.1.4. Save a spreadsheet as another file type like: template, text file, software specific file extension, version number.

4.1.1.5. Switch between open spreadsheets.

4.2. Cells

4.2.1.Insert, Select

Copyright© by *Accord Institute for Education Research*. All rights reserved.

4.2.1.3. Enter a number, date, text in a cell.
4.2.1.4. Select a cell, range of adjacent cells, range of non-adjacent cells, entire worksheet.

4.2.2. Edit, Sort
4.2.2.1. Edit cell content, modify existing cell content.
4.2.2.2. Use the undo, redo command.
4.2.2.3. Use the search command for specific content in a worksheet.
4.2.2.4. Use the replace command for specific content in a worksheet.
4.2.2.5. Sort a cell range by one criterion in ascending, descending numeric order, ascending, descending alphabetic order.

4.2.3. Copy, Move, Delete
4.2.3.1. Copy the content of a cell, cell range within a worksheet, between worksheets, between open spreadsheets.
4.2.3.2. Use the autofill tool/copy handle tool to copy, increment data entries.
4.2.3.3. Move the content of a cell, cell range within a worksheet, between worksheets, between open spreadsheets.
4.2.3.4. Delete cell contents.

4.3. Managing Worksheets

4.3.1. Rows and Columns
4.3.1.1. Select a row, range of adjacent rows, range of non-adjacent rows.
4.3.1.2. Select a column, range of adjacent columns, range of non-adjacent columns.
4.3.1.3. Insert, delete rows and columns.
4.3.1.4. Modify column widths, row heights to a specified value, to optimal width or height.
4.3.1.5. Freeze, unfreeze row and/or column titles.

4.4. Formulas and Functions

4.4.1. Arithmetic Formulas
4.4.1.1. Recognize good practice in formula creation: refer to cell references rather than type numbers into formulas.
4.4.1.2. Create formulas using cell references and arithmetic operators (addition, subtraction, multiplication, division).
4.4.1.3. Identify and understand standard error values associated with using formulas: #NAME?, #DIV/0!, #REF!.
4.4.1.4. Understand and use relative, absolute cell referencing in formulas.

4.4.2. Functions
4.4.2.1. Use sum, average, minimum, maximum, count, counta, round functions.
4.4.2.2. Use the logical function if (yielding one of two specific values) with comparison operator: =, >, <.

4.5. Formatting

4.5.1. Numbers/Dates
4.5.1.1. Format cells to display numbers to a specific number of decimal places, to display numbers with, without a separator to indicate thousands.
4.5.1.2. Format cells to display a date style, to display a currency symbol.
4.5.1.3. Format cells to display numbers as percentages.

4.5.2. Contents
4.5.2.1. Change cell content appearance: font sizes, font types.
4.5.2.2. Apply formatting to cell contents: bold, italic, underline, double underline.
4.5.2.3. Apply different colours to cell content, cell background.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

4.5.2.4. Copy the formatting from a cell, cell range to another cell, cell range.

4.5.3. Alignment, Border Effects

4.5.3.1. Apply text wrapping to contents within a cell, cell range.

4.5.3.2. Align cell contents: horizontally, vertically. Adjust cell content orientation.

4.5.3.3. Merge cells and center a title in a merged cell.

4.5.3.4. Add border effects to a cell, cell range: lines, colours.

4.6. Charts

4.6.1. Create

4.6.1.1. Create different types of charts from spreadsheet data: column chart, bar chart, line chart, pie chart.

4.6.1.3. Change the chart type.

4.6.1.4. Move, resize, delete a chart.

4.6.2. Edit

4.6.2.1. Add, remove, edit a chart title.

4.6.2.2. Add data labels to a chart: values/numbers, percentages.

4.6.2.3. Change chart area background colour, legend fill colour.

4.6.2.4. Change the column, bar, line, pie slice colours in the chart.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

8TH GRADE COMPUTER CURRICULUM

SECTION I: CONCEPTS OF INFORMATION TECHNOLOGY (2 WEEKS)

(Based on ICDL v4.0 – Module 1)

1. General Concepts
    1.1. Hardware, Software, Information Technology
    1.2. Types of Computer
    1.3. Main Parts of a Personal Computer
    1.4. Computer Performance
2. Hardware
    2.1. Central Processing Unit
    2.2. Memory
    2.3. Input Devices
    2.4. Output Devices
    2.5. Input/Output Devices
    2.6. Storage Devices
3. Software
    3.1. Types of Software
    3.2. Operating System Software
    3.3. Applications Software
    3.4. Graphical User Interface
    3.5. Systems Development
4. Information Networks (ICDL 1.4.4 omitted)
    4.1. LAN, WAN
    4.2. Intranet, Extranet
    4.3. The Internet
    4.4. Internet connection types: Dial-up, DSL, Cable
5. The Use of IT in Everyday Life
    5.1. Computers at Work
    5.2. Electronic World
6. Health and Safety, Environment
    6.1. Ergonomics
    6.2. Health Issues
    6.3. Precautions
    6.4. The Environment
7. Security
    7.1. Information Security
    7.2. Computer Viruses
8. Copyright and the Law
    8.1. Copyright

Copyright© by *Accord Institute for Education Research*. All rights reserved.

8.2. Data Protection Legislation

SECTION II: SPREADSHEETS (3 WEEKS)

(Based on ICDL v4.0)

1. Review
    1.1. Using the Application (ICDL 4.1)
        1.1.1. First Steps with Spreadsheets
        1.1.2. Adjust Settings
    1.2. Cells (ICDL 4.2)
        1.2.1. Insert Data
        1.2.2. Select Cells
        1.2.3. Rows and Columns
        1.2.4. Edit Data
        1.2.5. Duplicate, Move, Delete
            (Includes using AutoFill handle)
        1.2.6. Search and Replace
    1.3. Formatting (ICDL 4.5)
        1.3.1. Numbers/Dates
        1.3.2. Contents
        1.3.3. Alignment, Border Effects
    1.4. Charts/ Graphs (ICDL 4.6)
2. Cells
    2.1. Sort Data (ICDL 4.2.7)
3. Worksheets (ICDL 4.3)
4. Formulas and Functions (ICDL 4.4)
    4.1. Arithmetic Formulas
    4.2. Cell Referencing
    4.3. Working with Functions
5. Prepare Outputs (ICDL 4.7)
    5.1. Worksheet Setup
        5.1.1. Margins
        5.1.2. Orientation
        5.1.3. Scale
        5.1.4. Header, Footer
        5.1.5. Page numbers, etc
    5.2. Preparation (Preview, etc)

SECTION III: INTRODUCTION TO MULTIMEDIA (6 WEEKS)

1. Working with images
    1.1. Image formats
    1.2. Acquiring images
    1.3. Cropping and resizing images
    1.4. Red-eye removal
2. Working with videos

Copyright© by *Accord Institute for Education Research*. All rights reserved.

2.1. Importing/saving videos
2.2. Editing videos
    2.2.1. Ordering pieces on time line
    2.2.2. Splitting videos
    2.2.3. Trimming videos
    2.2.4. Merging videos
2.3. Enhancing videos
    2.3.1. Adding title and credits
    2.3.2. Adding transitions
    2.3.3. Adding sound to videos
    2.3.4. Using video effects

SECTION IV: INTRODUCTION TO 3D MODELING (6 WEEKS)

1. Create 2D shapes / surfaces (in a 3D environment)
    1.1. Create surfaces from lines, circles, freehand curves
    1.2. Generate surfaces from polygons, arcs
    1.3. Maintain coplanar geometry
2. Adding 3D objects
3. View / navigate models in 3D
    3.1. Rotate
    3.2. Pan
    3.3. Zoom
4. Create 3D objects
    4.1. 3D axis
    4.2. Components
    4.3. Adding text
5. Controlling 3D objects
    5.1. Select
    5.2. Move
    5.3. Scale

SECTION V: INTRODUCTION TO WEB DESIGN (6 WEEKS)

1. What is a webpage?
    1.1. The explanation of a web page
    1.2. Web page vs. website
    1.3. WSYIWYG
        1.3.1. WSYIWYG VS HTML code
2. Design Issues
    2.1. Design Principles (C.R.A.P.)
3. Preparing your website
    3.1. Project Proposal
    3.2. Simple plan of your web site
    3.3. Collecting/storing materials
    3.4. Layout

Copyright© by *Accord Institute for Education Research*. All rights reserved.

4. Developing your website
    4.1. Create a new site
        4.1.1. Site name
        4.1.2. Site description
        4.1.3. Share with
        4.1.4. Site theme
    4.2. Create a Page
        4.2.1. Template
        4.2.2. Location
    4.3. Edit Mode
        4.3.1. Insert layout
        4.3.2. Text Formatting
        4.3.3. Insert Image
        4.3.4. Insert a text box
        4.3.5. Insert attachments
        4.3.6. Insert video
        4.3.7. Create links
    4.4. Change the Appearance of your site
        4.4.1. Site elements (e.g. navigation)
        4.4.2. Color and fonts
        4.4.3. Theme

SECTION VI: INTRODUCTION TO PROGRAMMING (7 WEEKS)

1. **Scratch 1**: Getting Started: an Introductory Course
   http://learnscratch.org/sc/LP_Scratch1.pdf
2. **Scratch 2**: Step by Step: A Course in Scratch Programming
   http://learnscratch.org/sc/LP_Scratch2.pdf

Copyright© by *Accord Institute for Education Research*. All rights reserved.

INTRODUCTION TO PROGRAMMING ANNUAL PLAN

SECTION I: PROGRAMMING WITH SCRATCH

WEEK 1

- *Video*: Introduction to Scratch
  - MP4: http://llk.media.mit.edu/projects/scratch/videos/ScratchIntro.mp4
  - WMV: http://llk.media.mit.edu/projects/scratch/videos/ScratchIntro.wmv
- *Activity*: Getting Started with Scratch
  - http://info.scratch.mit.edu/sites/infoscratch.media.mit.edu/files/file/ScratchGettingStartedv14.pdf
- Scratch 1 (http://learnscratch.org/video-courses/scratch-1)
  - Lesson 1 (http://learnscratch.org/sc1-l1)
  - Lesson 2 (http://learnscratch.org/sc1-l2)
  - Lesson 3 (http://learnscratch.org/sc1-l3)
- *Homework*: Scratch Cards-1 (http://info.scratch.mit.edu/sites/infoscratch.media.mit.edu/docs/01_changecolor_v14.pdf)
- *Homework*: Scratch Cards-2 (http://info.scratch.mit.edu/sites/infoscratch.media.mit.edu/docs/02_movetoabeat_v14.pdf)
- *Homework*: Scratch Cards-3 (http://info.scratch.mit.edu/sites/infoscratch.media.mit.edu/docs/03_keymoves_v14.pdf)

WEEK 2

- Scratch 1 (http://learnscratch.org/video-courses/scratch-1)
  - Lesson 4 (http://learnscratch.org/sc1-l4)
  - Lesson 5 (http://learnscratch.org/sc1-l5)
  - Lesson 6 (http://learnscratch.org/sc1-l6)
  - Lesson 7 (http://learnscratch.org/sc1-l7)
  - Lesson 8 (http://learnscratch.org/sc1-l8)
- *Homework*: Scratch Cards-4 (http://info.scratch.mit.edu/sites/infoscratch.media.mit.edu/docs/04_saysomething_v14.pdf)
- *Homework*: Scratch Cards-5 (http://info.scratch.mit.edu/sites/infoscratch.media.mit.edu/docs/05_glide_v14.pdf)
- *Homework*: Scratch Cards-6 (http://info.scratch.mit.edu/sites/infoscratch.media.mit.edu/docs/06_followthemouse_v14.pdf)
- *Homework*: Scratch Cards-7 (http://info.scratch.mit.edu/sites/infoscratch.media.mit.edu/docs/07_dancetwist_v14.pdf)
- *Homework*: Scratch Cards-8 (http://info.scratch.mit.edu/sites/infoscratch.media.mit.edu/docs/08_interactivewhirl_v14.pdf)

Copyright© by *Accord Institute for Education Research*. All rights reserved.

WEEK 3

- Scratch 2 (http://learnscratch.org/video-courses/scratch-2)
    - Unit 1 (http://learnscratch.org/sc2-u1/sc2-u1i) – Lesson 1, 2, 3, 4, 5, 6
- *Homework*: Scratch Cards-11 (http://info.scratch.mit.edu/sites/infoscratch.media.mit.edu/docs/11_surprisebutton_v14.pdf)
- *Homework*: Scratch Cards-12 (http://info.scratch.mit.edu/sites/infoscratch.media.mit.edu/docs/12_keepscore_v14.pdf)
- *Homework*: Scratch Cards-9 (http://info.scratch.mit.edu/sites/infoscratch.media.mit.edu/docs/09_animateit_v14.pdf)
- *Homework*: Scratch Cards-10 (http://info.scratch.mit.edu/sites/infoscratch.media.mit.edu/docs/10_movinganimation_v14.pdf)

WEEK 4

- Scratch 2 (http://learnscratch.org/video-courses/scratch-2)
    - Unit 2 (http://learnscratch.org/unit-2) – Lesson 7, 8, 9, 10, 11

WEEK 5

- Scratch 2 (http://learnscratch.org/video-courses/scratch-2)
    - Unit 3 (http://learnscratch.org/sc2-u3/sc2-u3i) – Lesson 12, 13, 14, 15, 16

WEEK 6

- Scratch 2 (http://learnscratch.org/video-courses/scratch-2)
    - Unit 4 (http://learnscratch.org/sc2-u4/sc2-u4i) – Lesson 17, 18, 19, 20

WEEK 7

- Scratch 2 (http://learnscratch.org/video-courses/scratch-2)
    - Unit 5 (http://learnscratch.org/sc2-u5) – Lesson 21, 22, 23, 24

WEEK 8

- Scratch 3 (http://learnscratch.org/video-courses/scratch-3)
    - Unit 1 (http://learnscratch.org/sc3-u1/sc3-u1i) – Lesson 1, 2, 3, 4, 5

WEEK 9

- Scratch 3 (http://learnscratch.org/video-courses/scratch-3)
    - Unit 2 (http://learnscratch.org/sc3-u2) – Lesson 6, 7, 8, 9, 10

WEEK 10

- Scratch 3 (http://learnscratch.org/video-courses/scratch-3)
    - Unit 3 (http://learnscratch.org/sc3-u3) – Lesson 11, 12, 13, 14

WEEK 11

- Scratch 3 (http://learnscratch.org/video-courses/scratch-3)
    - Unit 4 (http://learnscratch.org/sc3-u4) – Lesson 15, 16, 17, 18, 19

Copyright© by *Accord Institute for Education Research*. All rights reserved.

WEEK 12

- Scratch 3 (http://learnscratch.org/video-courses/scratch-3)
    - Unit 5 (http://learnscratch.org/sc3-u5) – Lesson 20, 21, 22, 23

WEEK 13

- Scratch 3 (http://learnscratch.org/video-courses/scratch-3)
    - Unit 6 (http://learnscratch.org/sc3-u6) – Lesson 24, 25, 26, 27, 28, 29

WEEK 14

- Scratch 3 (http://learnscratch.org/video-courses/scratch-3)
    - Unit 7 (http://learnscratch.org/sc3-u7) – Lesson 30, 31, 32

WEEK 15-18

- Scratch Projects (Game, story, animation etc.)
    - Sample storytelling:
        - Evaluation (http://wiki.classroom20.com/file/view/storytelling+self+eval.doc)
        - Rubric (http://wiki.classroom20.com/file/view/storytelling+rubric.doc)
- Scratch activities can be used (http://wiki.classroom20.com/file/view/Scratch_Activities_by_Richard_Wiktorowicz.pdf)

SECTION II: PROGRAMMING LANGUAGE CONCEPTS

Lecture material locations:

- Lecture notes are in the 'Lecture Notes' folder.
- Slides, homework assignments and quizzes are located in the folder of the corresponding weeks.
- Programming assignment of practice sessions are in the 'Programming Assignments' folder. Main programming assignment documents are:
    - 'Programming Assignments-CPP.pdf' in C++
    - 'Programming Assignments-Scratch.pdf' in Scratch
    - Exercise numbers indicated in the parenthesis specify the questions in these documents
    - All source codes are in 'codes-assignments' folder
- Supplemental documents are:
    - Problem set for Unit 4: '4-Looping-ProblemSet.pdf'
    - Problem set for Unit 6: '6-Variables_Char String-ProblemSet.pdf'
    - Question pool for C++: 'Question Pool-CPP-questions.pdf'
    - Source codes of the question pool are in 'codes-question pool' folder

WEEK 19

- *Warm up*: Scratch review & exercises
- *Lecture*: 1-Introduction (*1-Introduction-teacher.pdf*)
- Slides (*1-Introduction-1.ppsx*)
- Slides (*1-Introduction-2.ppsx*)
- Homework (*1-Introduction-hw1.pdf*)
- Quiz (*1-Introduction-q1.pdf*)
- *Practice*: 1-Introduction (All questions)

Copyright© by *Accord Institute for Education Research*. All rights reserved.

WEEK 20

- *Lecture*: 2-Variables – Integer Float (*2-Variables_Integer Float-teacher.pdf*)
- Slides (*2-Variables_Integer Float-1.ppsx*)
- Homework (*2-Variables_Integer Float-hw1.pdf*)
- Quiz (*2-Variables_Integer Float-q1.pdf*)
- Slides (*2-Variables_Integer Float-2.ppsx*)
- Homework (*2-Variables_Integer Float-hw2.pdf*)
- Quiz (*2-Variables_Integer Float-q2.pdf*)
- Slides (*2-Variables_Integer Float-3.ppsx*)
- Homework (*2-Variables_Integer Float-hw3.pdf*)
- Quiz (*2-Variables_Integer Float-q3.pdf*)
- *Practice*: 2-Variables – Integer Float (All questions)

WEEK 21

- *Review*: Chapter 1 & 2 (*Review-1_2-teacher.pdf*)
- Slides (*Review-1_2.ppsx*)
- Homework (*Review-1_2-hw.pdf*)
- Quiz (*Review-1_2-q.pdf*)
- *Lecture*: 3-Conditionals (*3-Conditionals-teacher.pdf*)
    - 1. If statement
    - 2. If-else
    - 3. Relational operators
- Slides (*3-Conditionals-1.ppsx*)
- Homework (*3-Conditionals-hw1.pdf*)
- Quiz (*3-Conditionals-q1.pdf*)
- *Practice*: 3-Conditionals (3.1)

WEEK 22

- *Lecture*: 3-Conditionals (*3-Conditionals-teacher.pdf*)
    - 4. Logical operators
    - 5. If-else if-else
- Slides (*3-Conditionals-2.ppsx*)
- Homework (*3-Conditionals-hw2.pdf*)
- Quiz (*3-Conditionals-q2.pdf*)
- *Practice*: 3-Conditionals (3.2)

WEEK 23

- *Lecture*: 4-Looping (*4-Looping-teacher.pdf*)
    - 1. Do-while loop
- Slides (*4-Looping-1.ppsx*)
- Slides (*4-Looping-2.ppsx*)
- Homework (*4-Looping-hw1.pdf*)
- Quiz (*4-Looping-q1.pdf*)
- *Practice*: 4-Looping (4.1)

Copyright© by *Accord Institute for Education Research*. All rights reserved.

WEEK 24

- *Lecture*: 4-Looping (*4-Looping-teacher.pdf*)
    - 2. While and For loops
- *Practice*: 4-Looping (*4-Looping-ProblemSet.pdf*)

WEEK 25

- *Lecture*: 4-Looping (*4-Looping-teacher.pdf*)
    - 3. Infinite loops
- Slides (*4-Looping-2.ppsx*)
- Homework (*4-Looping-hw2.pdf*)
- Quiz (*4-Looping-q2.pdf*)
- *Practice*: 4-Looping (4.2)

WEEK 26

- *Lecture*: 5-Arrays (*5-Arrays-teacher.pdf*)
- Slides (*5-Arrays.ppsx*)
- Homework (*5-Arrays-hw1.pdf*)
- *Practice*: 5-Arrays (5.1)

WEEK 27

- Quiz (*5-Arrays-q1.pdf*)

WEEK 28

- *Lecture*: 6-Variables – Char and String (*6-Variables_Char String-teacher.pdf*)
    - 1. Introduction
    - 2. String operations
- *Practice*: 6-Variables – Char and String (*6-Variables_Char String-ProblemSet.pdf*)

WEEK 29

- *Lecture*: 6-Variables – Char and String (*6-Variables_Char String-teacher.pdf*)
    - 3. Single character variables
    - 4. Strings as character arrays
- *Practice*: 6-Variables – Char and String (*6-Variables_Char String-ProblemSet.pdf*)

WEEK 30

- *Lecture*: 6-Variables – Char and String (*6-Variables_Char String-teacher.pdf*)
    - 5. String functions
- *Practice*: 6-Variables – Char and String (*6-Variables_Char String-ProblemSet.pdf*)

WEEK 31

- *Lecture*: 6-Variables – Char and String (*6-Variables_Char String-teacher.pdf*)
    - 5. String functions

Copyright© by *Accord Institute for Education Research*. All rights reserved.

WEEK 32

- *Lecture*: 6-Variables – Char and String (*6-Variables_Char String-teacher.pdf*)
    - 6. Array of strings

WEEK 33-36

- *Practice*: 6-Variables – Char and String (*6-Variables_Char String-ProblemSet.pdf*)
- *Practice*: Question pool (*Question Pool-CPP-questions.pdf*)

Copyright© by *Accord Institute for Education Research*. All rights reserved.

INTRODUCTION TO PROGRAMMING GUIDELINES

OBJECTIVES

Introduction to programming is intended for high school students as an elective class. The objective is to teach basic skills of programming and problem solving.

LESSON PLANS

The curriculum is given in 'Introduction to Programming-Curriculum.pdf' and the lesson plans are provided in 'Introduction to Programming-Annual plan.pdf'. Introduction to programming is one year course and composed in two sections. Annual plan is prepared with respect to five class hours a week. The classes are

SCRATCH PROGRAMMING

The class content assumes that students have no programming language experience. The curriculum does not assume that mathematical background beyond middle school math. Lesson Plans are divided in three sections:

- **Scratch 1**: Getting Started: An Introductory Course
- **Scratch 2**: Step by Step: A course in Scratch Programming
- **Scratch 3**: Scratch Projects: A Comprehensive Course

PROGRAMMING LANGUAGE CONCEPTS

In this section, students learn the basics of a state-of-art programming language such as C++, C#, or Java. Students will adapt the concept easily since they understand the concepts during their lessons with Scratch. Currently, lecture material includes C++.

Please read the following notes about classes:

- This course has strong emphasis on hand-on programming practice during the class. Students should write codes of all examples, exercises, and programming assignments during the classes.
- During the class, teachers are recommended to relate C++ topics with the topics in Scratch.
- If the classes of the week including homework, quizzes and programming assignments are finished, teacher can use supplemental C++ programming assignments in the 'Programming Assignments' folder during the practice class.
- Lecture material doesn't cover some of the examples and challenge questions provided in the curriculum. They also can be used.
- Slides cover most of the curriculum.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

SOFTWARE

- Scratch programming language is free and can be downloaded from: http://scratch.mit.edu/download
- Code::Blocks is a free C++ editor and can be downloaded from: http://www.codeblocks.org/downloads

LECTURE MATERIAL

The website http://learnscratch.org/ has all the necessary documents for Scratch:

- Teacher's lesson plans and lecture material of Scratch can be downloaded from: http://learnscratch.org/index.php?option=com_content&task=view&id=252&Itemid=346.
- Each lesson has tutorial videos, and activities. Corresponding lesson material can be reached at the navigation bar on the left side in the 'Video Courses' section. Annual plan contains necessary links.

C++ material is composed of the following documents:

- Lecture notes are in the 'Lecture Notes' folder.
- Slides, homework assignments and quizzes are located in the folder of the corresponding weeks.
- Programming assignment of practice sessions are in the 'Programming Assignments' folder. Main programming assignment documents are:
    - 'Programming Assignments-CPP.pdf' in C++
    - 'Programming Assignments-Scratch.pdf' in Scratch
    - Exercise numbers indicated in the parenthesis specify the questions in these documents
    - All source codes are in 'codes-assignments' folder
- Supplemental documents are:
    - Problem set for Unit 4: '4-Looping-ProblemSet.pdf'
    - Problem set for Unit 6: '6-Variables_Char String-ProblemSet.pdf'
    - Question pool for C++: 'Question Pool-CPP-questions.pdf'
- Source codes of the question pool are in 'codes-question pool' folder

RESOURCES

The following textbook can be used as a supplemental material:

- Scratch Programming for Teens, J. L. Ford, Course Technology PTR, 2008.

BUDGET

Zero cost estimated.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

DIGITAL ARTS CURRICULUM

SECTION I: DIGITAL ARTS CONCEPTS

1. Introduction to Digital Arts
    - 1.1. Elements of design
        - 1.1.1. Line
        - 1.1.2. Shape
        - 1.1.3. Size
        - 1.1.4. Space
        - 1.1.5. Color
        - 1.1.6. Texture
        - 1.1.7. Value
    - 1.2. Principles of design
        - 1.2.1. Balance
        - 1.2.2. Contrast
        - 1.2.3. Emphasis
        - 1.2.4. Proportion
        - 1.2.5. Pattern
        - 1.2.6. Gradation
2. Proportion and Scale
3. Color Theory
4. Typography
5. Digital Photography

SECTION II: RASTER GRAPHIC IMAGES

1. Improving Digital Photos
    - 1.1. Rescaling
    - 1.2. Cropping
    - 1.3. Brightening and Darkening
        - 1.3.1. Brightness-Contrast
        - 1.3.2. Levels
        - 1.3.3. Curves
    - 1.4. Rotating
        - 1.4.1. Rotation by Multiples of 90 Degrees
        - 1.4.2. Free rotation
    - 1.5. Sharpening
    - 1.6. Fixing Red-eye
2. Introduction to Layers
    - 2.1. The Text tool
    - 2.2. The Move tool

Copyright© by *Accord Institute for Education Research*. All rights reserved.

- 2.3. Simple Effects Using Layers
  - 2.3.1. Drop Shadows
- 2.4. Copy/Paste
  - 2.4.1. Select only the Part You Want to Paste
- 2.5. Layer Mode
- 2.6. Opacity
- 2.7. Operations on Layers
  - 2.7.1. New
  - 2.7.2. Duplicate
  - 2.7.3. Merge
  - 2.7.4. Delete
- 2.8. Making Simple GIF Animations

3. Drawing
   - 3.1. A New Image
   - 3.2. Using Layers for Drawing
   - 3.3. Drawing Rectangles, Circles, and Other Shapes
     - 3.3.1. Defining Regions
     - 3.3.2. Outlining Selections: Stroking
     - 3.3.3. Free Select with the Lasso
     - 3.3.4. Filling Regions
     - 3.3.5. The Bucket Fill Tool
     - 3.3.6. Patterns
     - 3.3.7. Gradients
   - 3.4. A Drawing Project
     - 3.4.1. Drawing a Tree
     - 3.4.2. Making a Box Using Perspective Transformation
     - 3.4.3. Preparing the Planter Box
     - 3.4.4. Increasing Canvas Size
     - 3.4.5. Plant the Tree
     - 3.4.6. Final Touch-Ups
4. Selection
   - 4.1. Working with Selections
     - 4.1.1. Marching Ants
     - 4.1.2. The Select Menu
     - 4.1.3. Moving Selections
   - 4.2. Select by Color and Fuzzy Select
     - 4.2.1. Select Contiguous Regions
   - 4.3. Bezier Paths
     - 4.3.1. Defining a Path
     - 4.3.2. The Paths Dialog
     - 4.3.3. Curved Paths
     - 4.3.4. Adding Nodes or Segments and Moving Paths
     - 4.3.5. Moving or Modifying an Existing Path
   - 4.4. The Intelligent Scissors
   - 4.5. Modifying Selections with Selection Modes
   - 4.6. The QuickMask

Copyright© by *Accord Institute for Education Research*. All rights reserved.

4.7. Highlighting Foreground Objects
4.8. Using Channel Masks to Save a Selection
4.8.1. Layer Masks
4.9. Extracting Foreground Objects with SIOX
5. Erasing and Touching Up
5.1. Dimming Highlights with Dodge and Burn
5.1.1. Dodging
5.1.2. Burning
5.2. Smudging Blemishes Away
5.2.1. The Clone Tool, For More Difficult Jobs
5.2.2. Setting the Clone Source
5.2.3. Fine-tuning a Clone Job
5.2.4. Clone Tool Options
5.3. Copying Small Regions
5.4. Sharpening or Blurring Specific Regions: The Convolve Tool
5.4.1. Sharpening with the Convolve Tool
5.4.2. Blurring with the Convolve Tool
5.5. Blurring Backgrounds with Gaussian Blur
5.6. Correcting Color Balance
5.6.1. Hue-Saturation
5.6.2. Color Balance
5.6.3. Using Curves or Levels for Balancing Colors
6. Filters and Effects
6.1. Filters for Images
6.1.1. Tools vs. Plug-Ins
6.1.2. The Filters Menu
6.1.3. Blur
6.1.4. Enhance
6.1.5. Distorts
6.1.6. Light and Shadow
6.1.7. Noise Filters
6.1.8. Edge-Detection Filters
6.1.9. “Generic” Filters
6.1.10. Combine
6.1.11. The Artistic Filters
6.1.12. The Map Filters
6.1.13. Adding Patterns to a Layer
6.1.14. Filters to Help Make Web Pages
6.1.15. Animation Helpers
6.1.16. Alpha to Logo
6.1.17. Décor
6.2. Scripts to Make New Images: The Xtns Menu
7. Color Manipulation, Channels, and Layer Modes
7.1. Working with Grayscale or Black and White
7.1.1. Methods of Measuring Brightness
7.1.2. Grayscale Mode

Copyright© by *Accord Institute for Education Research*. All rights reserved.

7.1.3. De-saturate
7.1.4. Hue-Saturation
7.1.5. Decompose
7.1.6. Channel Mixer
7.2. Coloring Monochrome Images and Making Sepia Photos
7.2.1. Automatic Conversion with the “Old Photo” Filter
7.2.2. Manual Conversion for Fine Control
7.3. Using Threshold to Clean Up Scans
7.4. Pick Colors from the Image
8. Advanced Drawing
8.1. Useful Mask Tricks
8.1.1. Making Text “Fade Out”
8.1.2. Making a Fuzzy Border
8.1.3. Even Bigger Fuzzy Borders
8.1.4. Interpreting the Mask Border Color
8.2. Layer Modes
8.2.1. Addition, Subtract, and Difference
8.2.2. Multiply and Divide
8.2.3. Dodge and Burn, Screen and Overlay
8.2.4. Hard and Soft Lights
8.2.5. Darken or Lighten Only
8.2.6. Grain Extract and Grain Merge
8.2.7. Hue, Color, Saturation, and Value
8.2.8. Creating Depth: Drawing with Layer Modes
8.3. Combining Layer Modes: Making 3-D Letters
8.4. Drawing Realistic Shadows
8.4.1. Using an Object to Cast Its Own Shadow
8.4.2. Transparency: Add the Final Tweak
8.5. Realism and Multipoint Perspective
8.5.1. Single-Point Perspective
8.5.2. Two-Point Perspective
8.6. Adding Reflections and Shading
8.7. Making Brushes, Patterns, and Gradients
8.7.1. Making Brushes
8.7.2. Making Patterns
8.7.3. Making Gradients
9. Advanced Compositing
9.1. Colorizing Images
9.2. Improving Photos by Self-Compositing with Layer Modes
9.2.1. Using Screen Mode for Dark Images
9.2.2. Using Overlay or Hard Light When Light is Flat
9.2.3. Using Overlay or Burn to Cut Through Haze
9.3. Making Photos into Art: Self-Compositing with Modifications
9.3.1. Making “Drawings” and Other Effects Using Layer Offset
9.3.2. Adding Blurs and Other Tricks for Artistic Effects
9.4. Compositing Unrelated Images

Copyright© by *Accord Institute for Education Research*. All rights reserved.

9.4.1. Using Soft Light for Combining Images
9.4.2. Using Overlay for Dark Images
9.4.3. Using Screen to Get a Lighter Effect
9.4.4. Using Addition to Complement Light and Dark
9.4.5. Using Subtract to Make a Cut-out Mask
9.4.6. Making Eerie Colors with Burn
9.4.7. Using Grain Merge to Add Texture
9.5. Stacking Images
9.5.1. Reducing Noise
9.5.2. Loading All the Images as Layers
9.5.3. Registering the Images Using Difference Mode
9.5.4. Increasing Light by Additive Stacking
9.5.5. Increasing Contrast by Multiplicative Stacking
9.5.6. Increasing Resolution by Averaging
9.6. Stitching Panoramas

SECTION III: VECTOR GRAPHIC IMAGES

1. Introduction
1.1. Raster vs. Vector Graphics
2. Basic Shapes
2.1. Circle
2.2. Rectangle
2.3. Star
2.4. Spiral
2.5. Etc.
3. Editing Shapes
3.1. Move
3.2. Resize
3.3. Skew
3.4. Rotate
3.5. Duplicate
4. Coloring Shapes
4.1. Stroke Paint
4.2. Stroke Style
4.3. Color Fill
4.4. Gradient Fill
4.5. Pattern Fill
4.6. Transparency
5. Path Operations
5.1. Combine
5.2. Intersect
5.3. Trim
6. Text Formatting
6.1. Adding text
6.2. Modifying text

Copyright© by *Accord Institute for Education Research*. All rights reserved.

- 6.3. Aligning text
- 6.4. Attaching text to path
- 6.5. Flow text in a shape
- 6.6. Applying text style and filter
- 6.7. Text properties (font, size)

7. Paths
   - 7.1. Freehand drawing
   - 7.2. Bezier Curves
   - 7.3. Convert shapes into paths
   - 7.4. Editing paths
8. Organizing objects.
   - 8.1. Grouping and Ungrouping objects
   - 8.2. Align & distribute
   - 8.3. Layer Concept
9. 9. Applying style and filter
   - 9.1. Blur
   - 9.2. Shadow
   - 9.3. Emboss
   - 9.4. Glow
10. Bitmaps
    - 10.1. Color Contrast
    - 10.2. Bitmap Tracing

Copyright© by *Accord Institute for Education Research*. All rights reserved.

DIGITAL ARTS GUIDELINES

OBJECTIVES

This course is designed for high school students as an elective class. The objective is to teach the basics of Digital Arts Concept and picture manipulation.

LESSON PLANS

Digital Arts course is composed of three sections:

- Digital Arts Concepts
- Raster Graphic Images
- Vector Graphic Images

The course is a one year course. The curriculum is given in 'Digital Arts-Curriculum.pdf'. The course materials are aligned to GIMP and Inkscape software. GIMP assignments can be adapted to Photoshop or any other software if needed.

TEXTBOOK

No text book is needed.

SOFTWARE

Required software is GIMP and Inkscape. Both programs can be downloaded for free. Photoshop can be used instead of GIMP if already purchased.

LECTURE MATERIAL

The following tutorial is for 'Introduction to Digital Design' section:

- Inkscape tutorial: Elements - http://www.inkscape.org/doc/elements/tutorial-elements.html.

All information can be found in the 'GIMP' and 'Inkscape' folders. There are assignments, videos and necessary information for the teacher. GIMP assignments can be uploaded to Web, and can be easily navigated by clicking the file 'assignment.htm'.

During the classes, it is recommended to:

- Inform the students about the concepts in each chapter along with practice works. Give the students time to understand the concept before the assignments.
- At the end of each chapter, teachers may give projects that are covering the entire chapter. Tests or quizzes can be given after each chapter, too.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

RESOURCES

1. www.gimp.org
2. www.gimp-tuturials.net
3. www.inkscape.org

BUDGET

- Zero budget

Copyright© by *Accord Institute for Education Research*. All rights reserved.

WEB AUTHORING CURRICULUM

SECTION I: IMAGE EDITING BASICS

1. Introduction to Digital Arts
    1.1. Elements of design
        1.1.1. Line
        1.1.2. Shape
        1.1.3. Size
        1.1.4. Space
        1.1.5. Color
        1.1.6. Texture
        1.1.7. Value
    1.2. Principles of design
        1.2.1. Balance
        1.2.2. Contrast
        1.2.3. Emphasis
        1.2.4. Proportion
        1.2.5. Pattern
        1.2.6. Gradation
2. Proportion and Scale
3. Color Theory
4. Typography
5. Digital Photography

SECTION II: ANIMATION

1. Introduction
    1.1 Understand Flash Environment
    1.2 Working with layers
    1.3 Working on Timeline
        1.3.1 Frames
        1.3.2 Frame Rate
        1.3.3 KeyFrame
        1.3.4 Playhead
2. Drawing
    2.1 Using drawing tools
    2.2 Editing
    2.3 Working with text
3. Working with Symbols and Interactivity
    3.1 Work with symbols and instances
        3.1.1 Graphic

Copyright© by *Accord Institute for Education Research*. All rights reserved.

3.1.2 Button
3.1.3 Movie Clip
3.2 Work with libraries
3.2.1 Organizing libraries
3.3 Assign actions
3.3.1 Button
3.3.2 Movie Clip
3.3.3 Layer
4. Creating Animation
4.1 Create frame by frame animation
4.2 Create Motion-Tween and Shape Tween
4.2.1 Motion guide
4.2.2 Tween properties
4.2.3 Changing color option
4.3 Animate text
4.4 Mask
4.5 Add scene
4.6 Add Filter

SECTION III: CREATING WEB SITE

1. Introduction
1.1 Citation, Copyright and privacy
1.2 How to plan a web site
1.3 Evaluating and analyzing a web site
1.4 Plan and define a web site
2. Developing a web page
2.1 HTML basics
2.2 Tags and attributes
2.3 Background color and image
2.4 Paragraph Styles
2.5 Text formatting
2.6 Hyper-Links
2.7 Using images
2.8 Text alignment
2.9 Tables
2.9.1 Rows and Columns
2.10 Create head contents and set page properties
2.10.1 Using meta text

VISUAL WEB DESIGN

3. Working with text and graphics
3.1 Introduction to Web development application.
3.2 Code and design views
3.3 Menus and Toolbars

Copyright© by *Accord Institute for Education Research*. All rights reserved.

3.4 Page properties
3.5 Design interface
3.6 Editing modifying and formatting text
3.7 Inserting, modifying images
3.8 Paragraph and page formatting
3.9 Hyperlinks
3.9.1 Define targets
3.9.2 Hyperlink to web address, e-mail, tags and images
3.10 Tables
3.10.1 Rows
3.10.2 Columns
3.10.3 Alignment
3.10.4 Cell alignment
3.10.5 Merge and splits cells
3.11 Layers (Div)
3.12 Simple forms
3.12.1 Using forms

Copyright© by *Accord Institute for Education Research*. All rights reserved.

WEB AUTHORING GUIDELINES

OBJECTIVES

This course is intended for high school students as an elective class. The objective is to teach the basics of preparing quality websites.

LESSON PLANS

Web authoring course offered here is a one year course composed of three sections:

- Image Editing Basics
- Animation
- Creating Web Page

The course can be also provided a half year course by removing the first part: 'Image Editing Basics' and requiring 'Digital Arts' as the prerequisite class.

The curriculum is given in 'Web Authoring-Curriculum.docx'. The course material below is aligned to 'Adobe Creative Suite 8: Fireworks / Flash / Dreamweaver'. It can be adapted to the other software such as 'Microsoft Silverlight' if needed.

TEXTBOOK

- The Web Collection, Revealed: Macromedia Dreamweaver 8, Flash 8, and Fireworks 8, Deluxe Education Edition, J.E. Shuman, S. Bishop, B.M. Waxer, 2005.

Instead of purchasing individual book, it is recommended to buy the Class Set as used from bookstores or online shopping sites such as Amazon.

SOFTWARE

Required software is Adobe Creative Suite 8. Site license or education version is much cheaper (for non-profit organizations).

LECTURE MATERIAL

The following tutorial is for 'Image Editing Basics' section:

- Inkscape tutorial: Elements - http://www.inkscape.org/doc/elements/tutorial-elements.html.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

All information can be found in the 'Web Authoring-Web' folder including the computer lab rules, lecture notes, assignments, and necessary information for the teacher. This folder can be uploaded to Web, and can be easily navigated by clicking the file 'Web_Authoring.htm'.

During the classes it is recommended to:

- Inform the students about the topics in each chapter using PowerPoint slides. Use Chapter Power Point to introduce chapter objective (you should get teacher resources, i.e. book).
- Skill review – Teacher show it on projector while students will do it on their computer.
- Assign Project builder and extra projects
- Give test

Grading is based on assignments (Book assignments), test and creativity.

RESOURCES

Teacher is recommend to register to textbook's website http://www.course.com hence can use the material in the webpage provided by the 'Companion Site' link. The 'Companion Site' consists of lecture slides, syllabus, student files, exams and solutions.

In addition, teachers can check the following resources:

- Lynda training CDs for teachers: http://store.lynda.com/.
- http://www.tutorialized.com/

BUDGET

- **Textbook**: ~$300-$400 (Class set for 25 students)
- **Site license**: $8,000
- For district license, reseller needs to be called

Copyright© by *Accord Institute for Education Research*. All rights reserved.

DESKTOP PUBLISHING CURRICULUM THEORETICAL MODEL FOR DEVELOPMENT

DILEK ARISOYLU

Desktop Publishing curriculum was designed and developed based on **ADDIE Model**. The ADDIE Model is a systematic instructional design model and provides a step-by-step process that helps instructional designers plan and develop educational products. It consists of five phases: Analysis, Design, Development, Implementation, and Evaluation (ADDIE Model at Learning-Theories, 2010). The following paragraphs explain how each phase was practiced while creating Desktop Publishing curriculum.

Analysis:

Analysis typically means figuring out what to do, examining the learner and the content, finding out gaps/needs, establishing goals, and determining a plan for a solution system (Marshall, 2005).

In the first phase of the ADDIE model, a performance analysis was conducted. Phone interview was used for gathering information during the analysis. In addition, regular meetings with the client were held via phone during the development of the curriculum.

1. **Performance Analysis**
   Performance Analysis is an initial study for partnering with clients to find out their needs and help them achieve their goals. It defines whether it is an opportunity/problem/need and what to do about it (Rossett, 1999).

   a. **Define the actual (opportunity/problem/development/strategic planning)**
      The client stated that there is a need for an elective course on Desktop Publishing in member high schools. According to the client, member high schools are willing to open this course because Desktop Publishing is a very popular topic and complements with other courses such as Digital Arts and Web Authoring. To be able to open a course, a curriculum, teachers' guideline, and annual plan were needed to be developed for teachers.

      Besides, the client had a sample curriculum developed by a computer teacher who works in one of their member schools and has taught the course with respect to this curriculum.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

Actual/Current situation:

- Desktop Publishing course is needed
- For this course, a curriculum and teachers' guideline are needed
- There was a Desktop Publishing course created by a teacher, but the teacher did not partner with the client when developing the course. Therefore the client did not disseminate the curriculum to the other member schools without examining the quality of the course.

The request asked by the client was analyzed if it was a roll-out (opportunity) or a performance problem. Based on the current situation described on the above paragraph, it was decided that the need was a roll-out, therefore cause analysis was not conducted.

b. Define Optimal

Having looked at the sample curriculum that the client had, we realized that the curriculum was designed mainly to teach specific Desktop Publishing software (i.e. Microsoft Office Publisher 2007) rather than Desktop Publishing concept/principles.

Therefore, the client indicated two requirements on the Desktop Publishing course to be designed.

- The topics in the new curriculum should not depend on any Desktop Publishing software, in other words, the new curriculum shall be software agnostic. Thus the teachers can choose any Desktop Publishing software in their classes.
- The focus of this course will be Desktop Publishing concepts/principles. Teaching software is a secondary goal. The client stated that if students understand the Desktop Publishing concepts/principles thoroughly, they are able to use any Desktop Publishing software.

2. Audience Analysis

It is important to determine the characteristics of an audience in order to choose the best format and information when developing an instructional material (Pregent, 2000).

This course is designed for high school students who have prior knowledge about Microsoft Office programs such as Word/Excel/PowerPoint. It is assumed that competency levels of the students are similar. Their motivation for enrolling in this course is to improve their technological skills.

3. Goal Analysis

With the client, first, the goal of the course was defined to provide direction, which was

- Students will be knowledgeable about Desktop Publishing

Since goals are broad intent and are not measurable, goal analysis is needed to make fuzzy terms to be more tangible. In that way, it will be easy to see if the goals are achieved (Mager, 1997).

Copyright© by *Accord Institute for Education Research*. All rights reserved.

After the goal analysis, general objectives of the course were decided. Students will be able to

- Identify design principles when they see publications
- design and develop publications both from scratch and by using templates
- apply design principles when they create publications
- use a Desktop Publishing software to design publications

4. **Content Analysis**

Before developing the new curriculum, the subject of Desktop Publishing was researched in order to decide which topics would be covered in the curriculum. Online materials such as sample high school Desktop Publishing curriculums, articles, lesson plans and activities, and the text books on the market were examined.

As a topic, design principles and Microsoft Office Publisher 2007 were the focus of the research. Even though the software choice was optional, Microsoft Office Publisher 2007 was being suggested to teachers, so the research was done mainly in Publisher 2007.

To determine the course content in the new curriculum, all of the themes that seem relevant to the content were identified. Then the topics that constitute each theme were listed. With the client, the themes and the topics of the content were discussed and which ones were appropriate for the Desktop Publishing course was decided (Pregent, 2000).

Meeting with the computer teacher

It was crucial to hear the computer teacher's experiences regarding Desktop Publishing course, so another Performance analysis was conducted with him. Due to the long distance, phone interview was preferred to do performance analysis. The focus of the analysis was the textbook because the textbook that he chose to use in the class was same as the book that we decided. Basically, he explained the advantages of using that book, how he was using it in the class, the projects, how to assess the students, and how to improve the Desktop Publishing course (See the file PA_computerteacher.doc).

5. **Solution System**

A new curriculum, a teachers' guideline, a job aid for students and rubrics for the projects were decided to be developed. The online article (about.com) regarding Elements of design and some online lesson activities were decided to be modified according to high school students' level.

Design

In the Design phase;

- Storyboard is created (if applicable)
- The project's instructional design strategy is planned
- Outcomes (objectives of the course) are specified
- How these outcomes will be measured is defined (evaluation)
  The important thing here is that evaluation items are matched with the objectives (Marshall, 2005).

Copyright© by *Accord Institute for Education Research*. All rights reserved.

Before working on the objectives and evaluation, the anatomy of a lesson was built. The anatomy of a lesson explains a high-level structure for developing of all lessons and has four major sections (Clark, 1999):

- **Introduction**
  Why the lesson skills are important, content overview, the lesson objectives are explained.
- **Knowledge needed**
  According to topic, concepts, facts, or processes are shown
- **Major task(s) of the lesson**
  Procedure or principle task with practice are displayed
- **Summary**

In the content analysis, the topics were decided. In this section, the topics were examined whether they are fact, concept, process, procedure or principle based on the **Content Performance Matrix** (Clark, 1999).

The Content Performance Matrix are made up of the content (horizantal axis) and the outcomes(vertical axis) shown in the table.

Performance Outcomes	Apply					
	Remember					
		Fact	Concept	Process	Procedure	Principle
				Content		

In the Desktop Publishing curriculum, it was decided that there were concepts, procedures and principles in the content. These are;

- The major lesson is procedure: How to develop a publication
- Concepts: Each publication has own concepts (See the file teachers guideline.pdf)
- Principles: Design principles and design elements

Performance outcomes are written at a remember level or/and application level except facts (facts are written only remember level). Therefore, objectives in the curriculum were prepared;

- Concepts-----remember level
- Procedure---apply level
- Principle-----both remember and apply level

To be able to measure the objectives effectively, evaluation items were matched and designed with the objectives level.

Formative Evaluation

With the client, the objectives and the evaluation items were checked.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

Development

Development phase consists of

- Building of prototype
- Piloting the prototype with users
- Revising
- Creating products (Marshall, 2005)

In the development phase, the new curriculum, teachers' guideline including weekly plan, a job aid, rubric/assessments for the projects and hands-on activities were developed.

Formative Evaluation

The content in the new curriculum was discussed with the computer teacher who designed the previous curriculum. He agreed on the new curriculum and gave us suggestions to be added into the teachers' guideline.

How learning models/ theories/principles were applied into the teachers' guideline?

The following table demonstrates how the teaching methods and materials were prepared based on various models, theories and principles. The reason that we used these techniques was to make the course more enjoyable rather than boring for the students. The more variety in the class means the more engaged, participated students.

Teaching methods and materials	Model/Theory/Principle		
	Gagne's 9 instructional events	ARCS' Motivational model	Learning Theories
1. The topics that are taught on the first weeks such as the meaning of Desktop Publishing, how it is used, who is using, and why it is important, etc. 2. Speaker invitation (Desktop Publishing field) 3. Teachers use PowerPoint slides while teaching the content. 4. Students play game to reinforce the concepts and knowledge. 5. Students work on different types of projects. 6. There are some group working studies. 7. In addition to the textbook, students work on the online tutorials for the design principles.	1. Gain attention	Attention • Perceptual Arousal • Inquiry Arousal • Variability Relevance • Goal Orientation	
The objectives are defined both in the textbook and in the teachers' guideline. Teachers are informed in	2. Inform of Objectives	Confidence • Learning	Cognitivism Objectives

Copyright© by *Accord Institute for Education Research*. All rights reserved.

the guideline that they are supposed to talk about the objectives.		Requirements - Objectives	are defined.
Microsoft Publisher 2007 windows screen is similar to the other Microsoft products. Students when they were in 8th grade they studied some of the design principles such as CRAP. In other elective classes such as Digital Arts and Web Authoring, students learn the topics of design elements and image editing.	3.Recall for prior learning		Cognitivism New content is attached to the old content.
Students study the examples and non- examples of design principles in the online tutorials. Students have PowerPoint slides while studying the procedures.	4. Present Materials		
Students learn the topics (procedures and principles) by doing.			Cognitivisim Knowing and understanding rather than memorizing. Project-based learning and critical thinking
Teachers help students if they have a problem with completing the procedures.	5. Provide Guidance		
The course is full of hands-on activities and projects.	6. Elicit Performance		
Teachers give feedback whether they are on the right track when students work on their projects	7.Provide Feedback	Confidence • Feedback immediately after, just prior	Cognitivism
After each chapter, students are assessed on the specific project that teachers chose. Their projects are graded.	8. Assess Performance Doing it alone	Satisfaction • Knowledge of results	
A job aid, "How to do Desktop Publishing Guideline", was prepared for students. (Bear, Learning How to Do Desktop Publishing, 2010)	9.Enhance Transfer and Retention		
The difficulty level of the projects increase through		Confidence	

Copyright© by *Accord Institute for Education Research*. All rights reserved.

the course or as the course progress.		• Success opportunitiies Easy, then harder	
Projects in the book were designed in a context that reflects the real world.			Contextual learning-Cognitivism New content is attached to the real-life content.

Implementation

Teachers will deliver Desktop Publishing course in high schools.

Summative Evaluation

Kirkpatrick Level 2 was applied. Students are evaluated through the projects given on the textbook. Evaluation items were prepared to measure whether students were able to apply the procedures and principles learned in the class.

Future direction

1. For Summative Evaluation, Kirkpatrick Level 1 can be applied to students to find out what they think about the course in general. Survey can be used as a method and the questions are prepared to learn the textbook, hands-on activities, projects, online tutorials, games, teachers, and overall course.

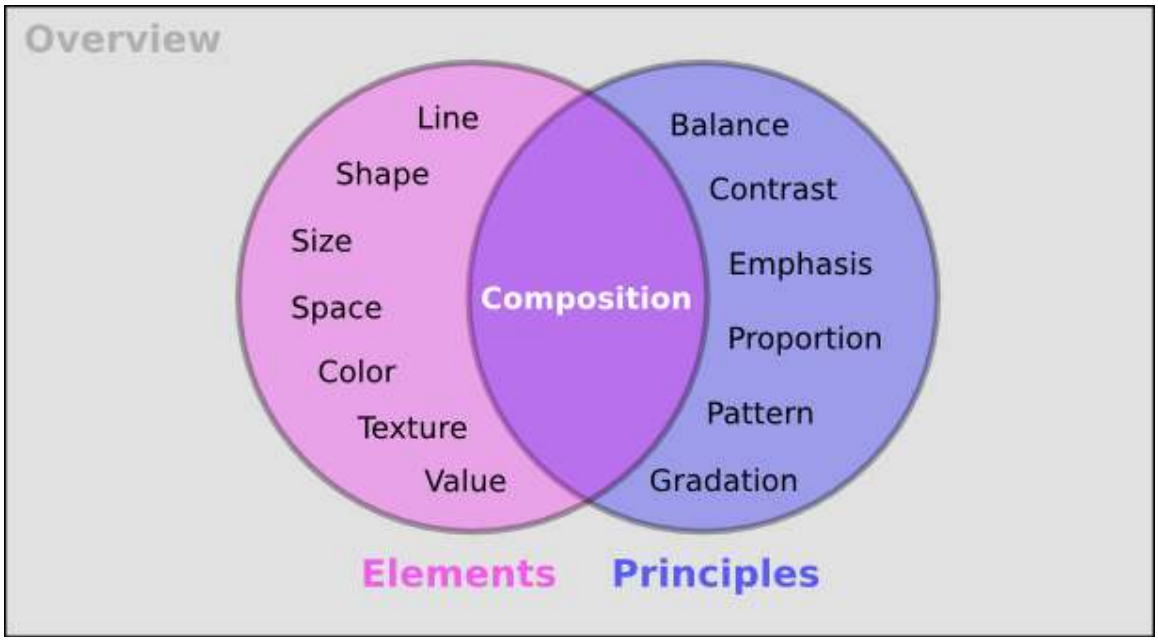
REFERENCES

- ADDIE Model at Learning-Theories. (2010, November 19). Retrieved from LearningTheoriesKnowledbase: http://www.learning-theories.com/addie-model.html
- Bear, J. H. (2010). Learning How to Do Desktop Publishing. Retrieved 2010, from about.com: http://desktoppub.about.com/cs/basic/a/desktopdocument.htm
- Bear, J. H. (2010). Principles of Design. Retrieved 2010, from about.com: http://desktoppub.about.com/cs/designprinciples/a/principlesintro.htm
- Clark, R. C. (1999). Developing Technical Training. Silver Spring MD: International Society for Performance Improvement.
- Mager, R. F. (1997). Goal Analysis. Atlanta,GA: The Center for Effective Performance Inc.
- Marshall, J. (2005, October). Meet ADDIE SDSU Edtec 540 Class notes. San diego, CA.
- Pregent, R. (2000). Charting Your Course. Madison : Atwood Publishing.
- Rossett, A. (1999). First Things Fast A Handbook for Performance Analysis. San Francisco: Jossey-Bass/Pfeiffer.

Copyright© by *Accord Institute for Education Research*. All rights reserved.

Introduction to Digital Arts

This tutorial will demonstrate the elements and principles of design which are normally taught to early art students in order to understand various properties used in art making. This is not an exhaustive list, so please add, subtract, and combine to make this tutorial more comprehensive.

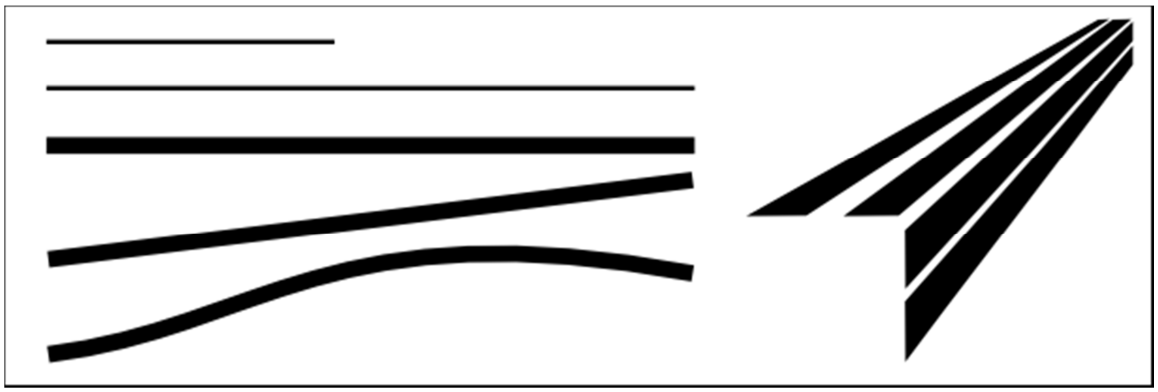


1 Elements of Design

The following elements are the building blocks of design.

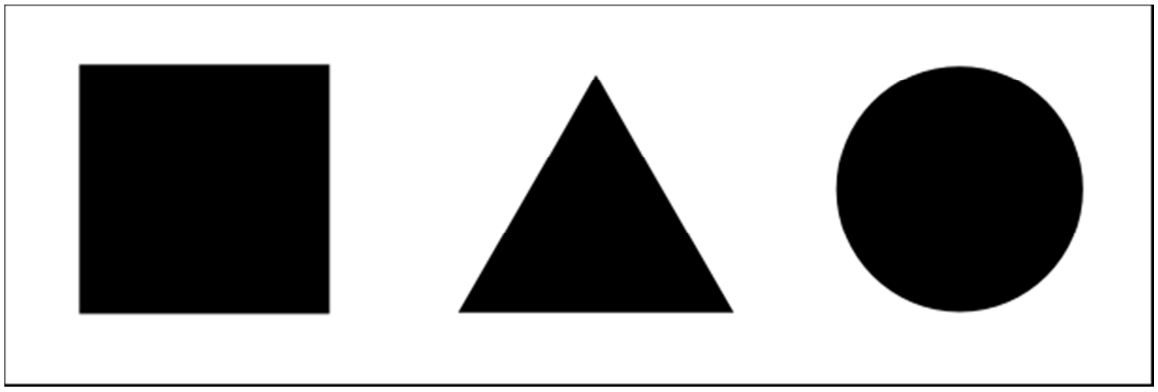
1.1 Line

A line is defined as a mark with length and direction, created by a point that moves across a surface. A line can vary in length, width, direction, curvature, and color. Line can be two-dimensional (a pencil line on paper), or implied three-dimensional.



1.2 Shape

A flat figure, shape is created when actual or implied lines meet to surround a space. A change in color or shading can define a shape. Shapes can be divided into several types: geometric (square, triangle, circle) and organic (irregular in outline).

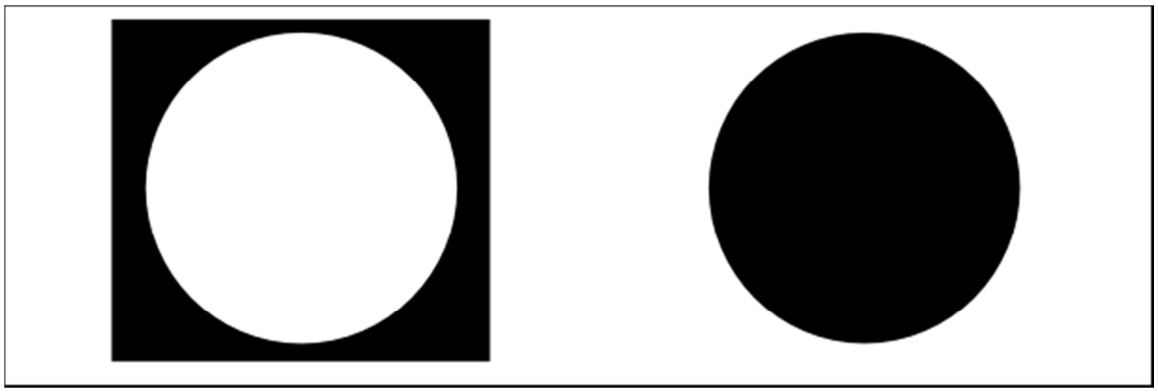


1.3 Size

This refers to variations in the proportions of objects, lines or shapes. There is a variation of sizes in objects either real or imagined.

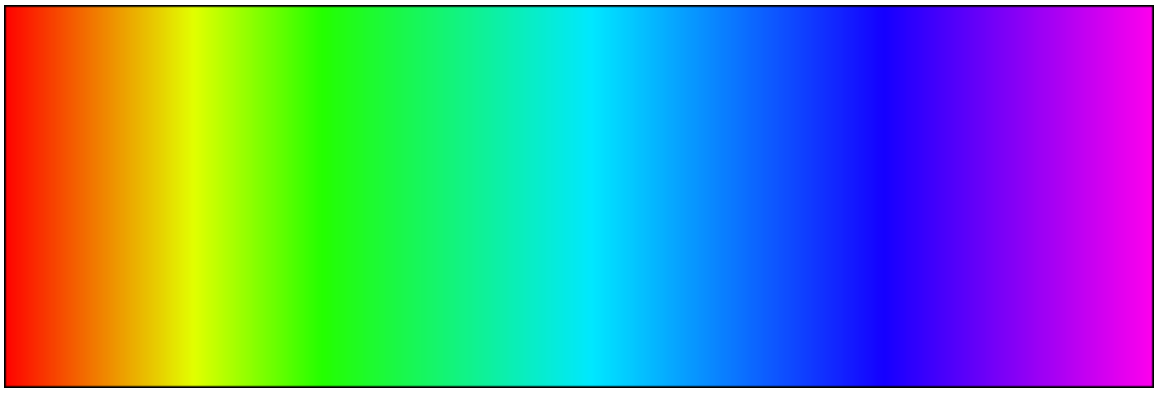
1.4 Space

Space is the empty or open area between, around, above, below, or within objects. Shapes and forms are made by the space around and within them. Space is often called three-dimensional or two- dimensional. Positive space is filled by a shape or form. Negative space surrounds a shape or form.



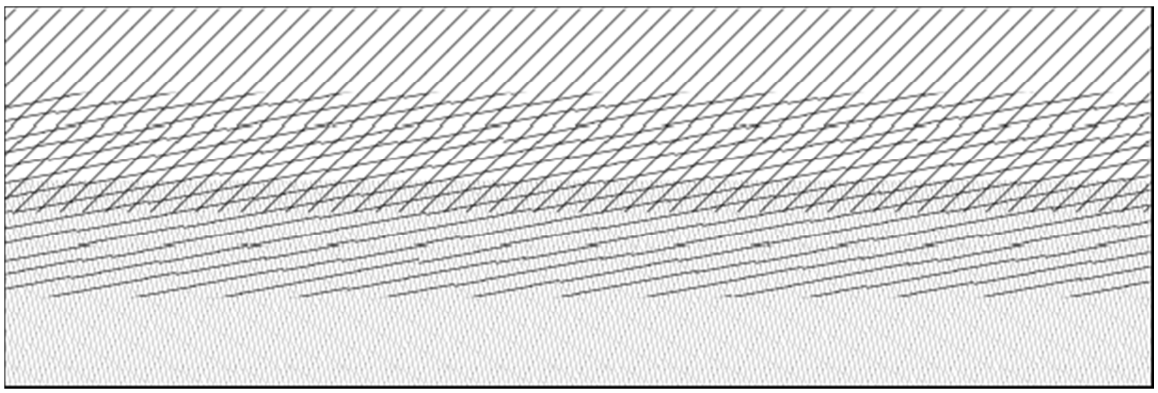
1.5 Color

Color is the perceived character of a surface according to the wavelength of light reflected from it. Color has three dimensions: HUE (another word for color, indicated by its name such as red or yellow), VALUE (its lightness or darkness), INTENSITY (its brightness or dullness).



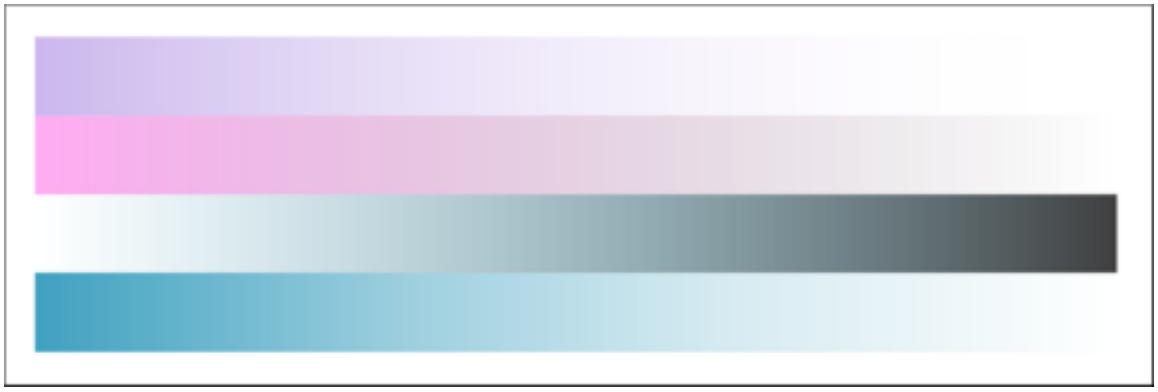
1.6 Texture

Texture is the way a surface feels (actual texture) or how it may look (implied texture). Textures are described by word such as rough, silky, or pebbly.



1.7 Value

Value is how dark or how light something looks. We achieve value changes in color by adding black or white to the color. Chiaroscuro uses value in drawing by dramatically contrasting lights and darks in a composition.

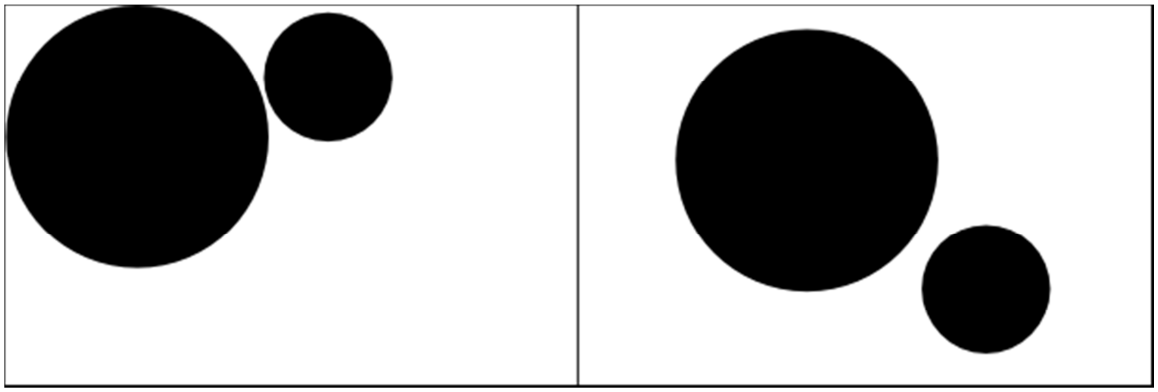


2 Principles of Design

The principles use the elements of design to create a composition.

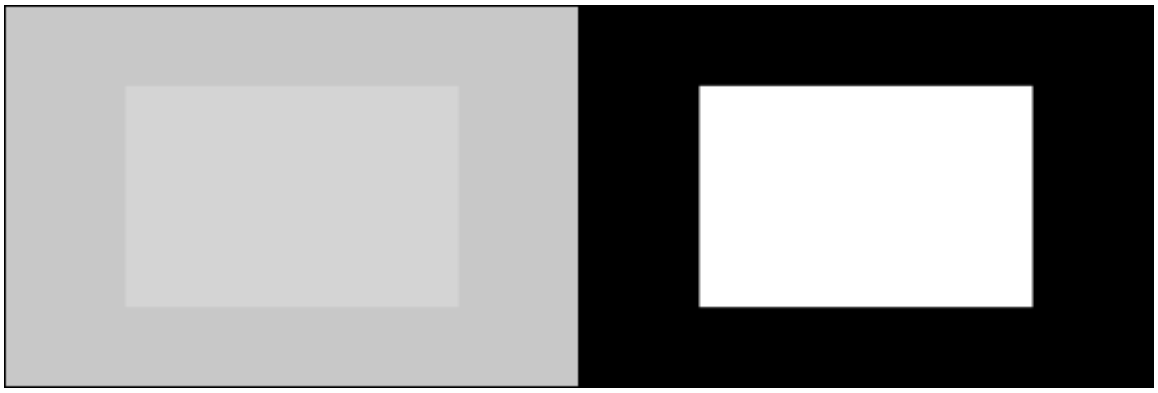
2.1 Balance

Balance is a feeling of visual equality in shape, form, value, color, etc. Balance can be symmetrical or evenly balanced or asymmetrical and un-evenly balanced. Objects, values, colors, textures, shapes, forms, etc., can be used in creating a balance in a composition.



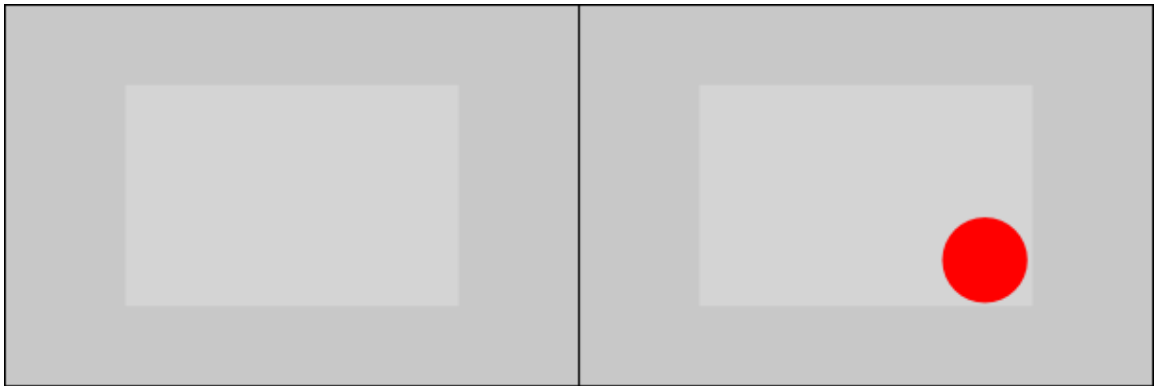
2.2 Contrast

Contrast is the juxtaposition of opposing elements



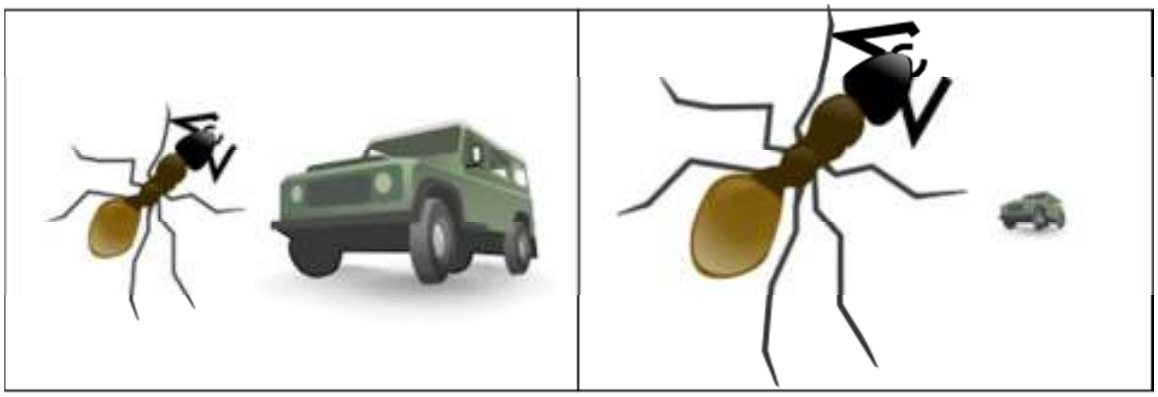
2.3 Emphasis

Emphasis is used to make certain parts of their artwork stand out and grab your attention. The center of interest or focal point is the place a work draws your eye to first.



2.4 Proportion

Proportion describes the size, location or amount of one thing compared to another.



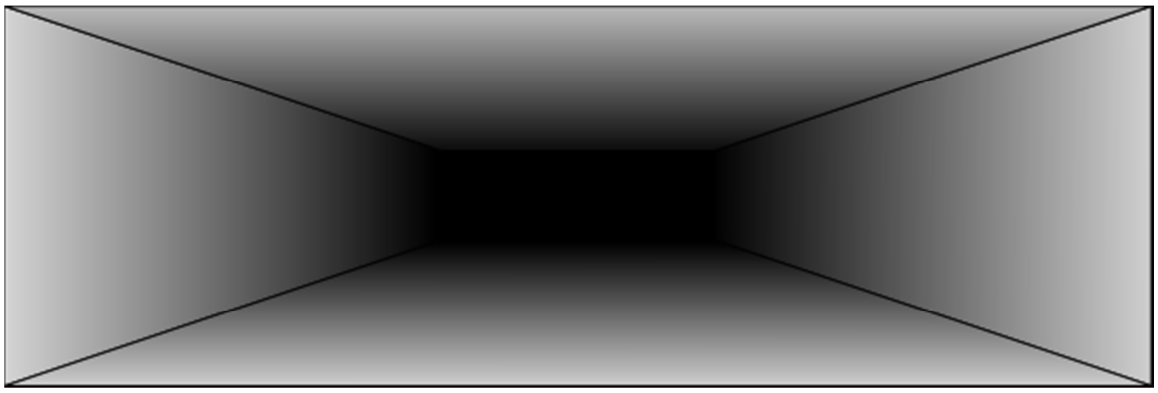
Random Ant & 4WD

2.5 Pattern

Pattern is created by repeating an element (line, shape or color) over and over again.

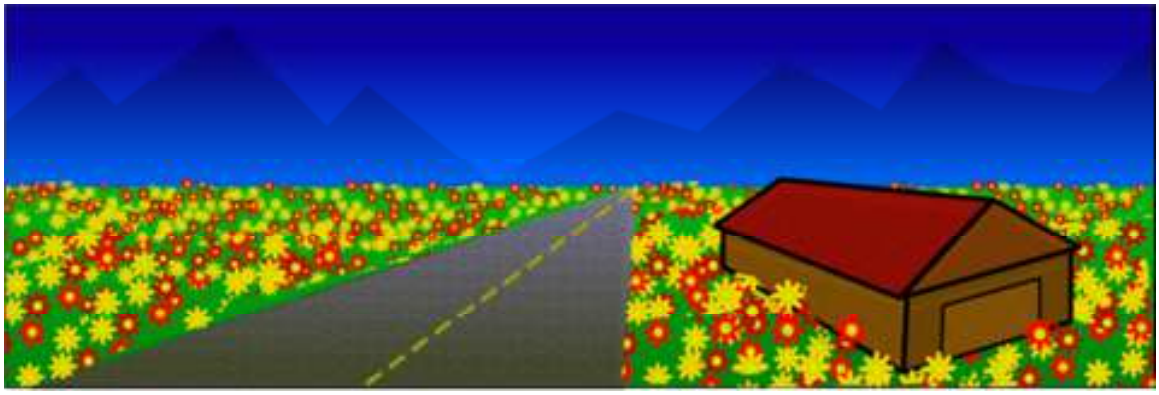
2.6 Gradation

Gradation of size and direction produce linear perspective. Gradation of color from warm to cool and tone from dark to light produce aerial perspective. Gradation can add interest and movement to a shape. A gradation from dark to light will cause the eye to move along a shape.



3 Composition

The combining of distinct elements to form a whole.



4 Bibliography

This is a partial bibliography used to build this document.

- http://sanford-artedventures.com/study/study.html
- http://www.makart.com/resources/artclass/EPlist.html
- http://www.princetonol.com/groups/iad/Files/elements2.htm
- http://oswego.org/staff/bpeterso/web/elements_and_principles.htm
- http://www.johnlovett.com/test.htm
- http://digital-web.com/articles/elements_of_design/
- http://digital-web.com/articles/principles_of_design/

Special thanks to Linda Kim (http://www.redlucite.org) for helping me (http://www.rejon.org/) with this tutorial. Also, thanks to the Open Clip Art Library (http://www.openclipart.org/) and the graphics people have submitted to that project.