Getting Started with Alice

### STAGE 1 – DESIRED RESULTS

**OVER-ARCHING CONCEPT:**
- Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools, and technologies.
- Data can be analyzed to make informed decisions using a variety of strategies, tools, and technologies.

**OVER-ARCHING QUESTION:**
- How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?
- How can collecting, organizing and displaying data help us analyze information and make reasonable and informed decisions?

### UNIT OVERVIEW:

Computer programming provides a new way of thinking and helps develop problem solving skills. The skills learned in writing computer programs can be applied to everyday problems to help us solve them.

### ESTABLISHED GOALS:

**Virginia Beach Objectives:**
- **VBCP.5** The student will learn the different components of a programming environment including: the purpose of documentation; basic programming constructs; and top-down design to solve a complex problem.
- **VBCP.6** The student will create a new virtual world, add objects to a virtual world and learn to use an objects properties, methods and functions to implement a solution.

**Virginia State SOL Objectives:**
- **COM.4** The student will design a step-by-step plan (algorithm) to solve a given problem. The plan will be in the form of a program flowchart, pseudo code, hierarchy chart, and/or data-flow diagram.
- **COM.5** The student will divide a given problem into manageable sections (modules) by task and implement the solution. The modules will include an appropriate user-defined function, subroutines, and procedures. Enrichment topics might include use-defined libraries (units) and object-oriented programming.
- **COM.7** The student will design and implement the output phase of a computer program, which will include designing output layout, accessing a variety of output devices, using output statements, and labeling results.
- **COM.8** The student will design and implement computer graphics, which will include topics appropriate for the available programming environment as well as student background. Students will use graphics as an end in itself, as an enhancement to other output, and as a vehicle for reinforcing programming techniques.

### APPLICABLE TEXTBOOK SECTIONS:
- **1.1** Introduction to Alice
- **1.2** Alice Concepts
- **Tips & Techniques 1**

### RECOMMENDED PACING:
- **Day 1** Overview, Alice Tutorials
- **Day 2** Appendix A Parts 1 and 2
- **Day 3** Read Chapter 1 and complete Reading Guide, Start Exercises
- **Day 4** Complete Exercises and Self-Assessment
- **Day 5** Quiz / Test on Chapter 1
## ENDURING UNDERSTANDINGS:
**TO MEET THE STANDARDS, STUDENTS WILL NEED TO UNDERSTAND THAT**

- A program is a set of instructions that tells the computer what to do.
- Documentation is an important part of writing a program.
- The fundamental ideas of writing a computer program are really very simple.
- Alice is an Object-Oriented programming language.
- Alice programs are created in a 3-D virtual world.
- Each Alice object has six degrees of freedom.
- The center of an Alice object provides a reference for measurement and for pivot or spin movements.

## ESSENTIAL QUESTIONS:
**TO UNDERSTAND, STUDENTS WILL NEED TO CONSIDER SUCH QUESTIONS AS**

- What kinds of instructions are available to create a computer program?
- What is the computer science concept of problem decomposition?
- How are 3-D models used in Alice?
- What directions can an Alice object move?
- How is distance measured between Alice objects?

## To understand, students will need to

**know…**

- The different parts of the Alice programming environment.
- The purpose of documentation.
- The basic programming constructs.
- How to use top-down design to solve a complex problem.
- How to create a new virtual world.
- How to add objects to a virtual world.
- How to use an object’s properties, methods and functions.

**be able to…**

- Use the Alice programming environment to create Alice programs.
- Document an Alice program.
- Solve a complex problem using top-down design.
- Use an object’s properties, methods, and functions to implement a solution.
**STAGE 2 – ASSESSMENT EVIDENCE**

*Students will demonstrate their understanding through a variety of assessments.*

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<th>PERFORMANCE TASKS:</th>
<th>OTHER EVIDENCE: (e.g., tests, quizzes, prompts, work samples, observations)</th>
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| 1. Complete Lab 1, Chapter 1 worksheet – Appendix 1B | - Complete the four tutorials and the associated tutorial worksheets.  
- Read chapter 1 and complete the associated reading guide – Appendix 1A  
- Quiz or test on tutorials |

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<th>STUDENT SELF-ASSESSMENT AND REFLECTION:</th>
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| 1. Write a short story (about 1 page in length) that could take place on one of the worlds you created in the chapter 1 exercises.  
2. Based on your brief introduction to Alice, do you think programming in Alice will be hard or easy? Give one or two examples that support your decision. |
STAGE 3 – LEARNING PLAN

Instructional strategies and learning experiences that promote development of the targeted understandings are

RECOMMENDED PACING:

Day 1 Overview, Alice Tutorials
Day 2 Appendix A Parts 1 and 2
Day 3 Read Chapter 1 and complete Reading Guide, Start Exercises
Day 4 Complete Exercises and Self-Assessment
Day 5 Quiz / Test on Chapter 1

RESOURCES:

Textbook: Learning to Program with Alice, Dann, Cooper, & Pausch Chapter 1
  1.1 Introduction to Alice
  1.2 Alice Concepts
  Tips & Techniques 1

Other Resources and Materials:
  - Alice Tutorials – Appendix 1C, 1D and 1E
  - Reading guide – Appendix 1A
  - Lab 1, Chapter 1 worksheet – Appendix 1B
  - www.Alice.org teacher resources

LESSON RECOMMENDATIONS:

1. The tutorials provide a good introduction to the Alice programming environment.
2. Since we only have class sets of textbooks, it is important that the reading activities be structured so they are completed in class.
3. The web resources include PowerPoint presentations as well as lesson ideas and test questions.
4. Students should write the self-assessment in their journals.