Objectives Students will be able to…

* **Complete** a long-form lab, using two-dimensional arrays of objects, array traversing algorithms, program analysis, binary numbers, inheritance, and interfaces.

Assessments Students will...

* **Complete** the Picture Lab

Homework

* **A list of homework assignments is provided below.**

# Materials & Prep

* **Projector and computer**
* **Picture Lab** Teacher’s Guide
* **Classroom copies** of the Picture Lab Student Guide
* **Associated Picture Lab & Picture Lab Extension** Files
* **Digital camera** (**optional**)
* **CD** (**optional**)
* **Egg cartons and small candies** (Skittles or M&Ms) (**optional**)
* **Photo negative** (**optional**)
* **Rectangular mirror** (**optional**)

Read through the Teacher, Student, and Extension guides ahead of time to familiarize yourself with the parts of this long-form lab. Using the guides, complete the lab on your own to spot possible challenges for your students. Upload all student files onto each computer desktop for student access. Don’t give the finalClasses folder to your students—it contains sample answers!

NOTE: If your students enter the classroom with prior programming knowledge, or if your class is moving through the AP course quickly with ease, you may want to deliver the Text Excel lab (included in Unit 5 materials) instead.

# Pacing Guide: Day 1

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 1 & 2 | Full class |
| Homework:  *Summarize your notes in your notebooks. Notebook checks in class tomorrow!* | TONIGHT |

# Pacing Guide: Day 2

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 3 & 4 | Full class |
| Notebook checks | During class |
| Homework:  *Outline Chapter 8* | TONIGHT |

# Pacing Guide: Day 3

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 5 | Full class |
| Notebook checks | During class |
| Homework:  *Read and highlight Chapter 2 of Barron’s review book. Skip* “the *this* keyword”. | TONIGHT |

# Pacing Guide: Day 4

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 6, continued | Full class |
| Check Barron’s review books for highlighting note-taking, and practice test completion and correction | During class |
| Homework:  *Read and highlight Chapter 5 of Barron’s review book.* | TONIGHT |

# Pacing Guide: Day 5

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 5 & 6 | Full class |
| Notebook checks | During class |
| Homework:  *Take the Chapter 2 exam in Barron’s review book, skipping #20. Grade your answers.* | TONIGHT |

# Pacing Guide: Day 6

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 7 | Full class |
| Homework:  *Read HW 8.5 and answer self-check questions 29-30* | TONIGHT |

# Pacing Guide: Day 7

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 8 | Full class |
| Creating a collage | During class |
| Homework:  *Finish up creating a collage* | TONIGHT |

# Pacing Guide: Day 8

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 9 | Full class |
| Simple edge detection algorithm and implementation | During class |
| Homework:  *Continue working on Simple edge detection.* | TONIGHT |

# Pacing Guide: Day 9

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 9, continued | Full class |
| Finish Simple edge detection | During class |
| Homework:  *Submit 5 review questions on the electronic survey.* | TONIGHT |

## About Barron’s

* + Barron’s is an AP CS A review book that some school provide students. If your school doesn’t provide Barron’s there are many alternative homework assignments that can be found at codingbat.com/java (no classes) or practice-it.
  + Alternatively, you can save time spent on the lab by checking activities as Homework.

# Procedure

*All guides, sample code, answer code, and example code may be found in the folder “Milestone 2 Picture Lab.”*

1. To help students start the lab smoothly, start Activity 1 as a whole group.

2. Encourage students to use their Tricky Code Cheat Sheets, 4 Commandments of Scope, notebooks, textbooks, classroom posters, and homework assignments.

3. Offer occasional time-checks to help keep students on pace.

4. Grade notebooks and review books in between helping students so students can keep notebooks for homework and studying in the evenings.

# Accommodation and Differentiation

In ELL classrooms, read all directions aloud before breaking into individual practice, and allow up to twice the amount of time for completion of the lab.

* To save time on the rest of the lab, don’t spend too much time reviewing binary numbers, and restrict color exploration (Activity 2) to ~20 minutes.
* Use the tactile exercises as suggested on page 6 of the Teacher’s guide (candy exercise and exploring the digital camera).

As needed, allow students to pair up to help each other with reading comprehension (but remind students that they each must submit their own code). Each day that you begin the lab, start with a quick survey of student concerns and questions.

* Adaptations for group work can be found on page 19 of the Teacher’s guide.

Assessment questions have been relocated to the practice exam, WS 5.7.