Objectives Students will be able to…

* **Complete** a long-form lab, demonstrating effective use of object-oriented program design, program implementation and analysis, and standard data structures and algorithms.

Assessments Students will...

* **Complete** the Elevens Lab

Homework

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

# Materials & Prep

* ***Elevens* Lab Teacher’s Guide**
* **Classroom copies** of the *Elevens* Lab Student Guide
* **Associated *Elevens* Lab Activity Starter Code**

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. Since later starter code packages include answers to the earlier sections of the lab, we recommend that you ***do not*** upload all student files onto computer desktops for student access. If possible, email *ActivityN Starter Code* to students the day of the lab. Otherwise, upload files manually to each desktop before each class period.

# Pacing Guide: Day 1

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 1 | Full class |
| Homework:  *Read section 13.3*  *Complete self-check questions #16-21, 23-24* | TONIGHT |

# Pacing Guide: Day 2

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 2 | Full class |
| Homework:  *Read section 13.4*  *Complete self-check questions #27-30* | TONIGHT |

# Pacing Guide: Day 3

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 2, continued | Full class |
| Homework:  *Summarize notes and fill in missing days for notebook check tomorrow.* | TONIGHT |

# Pacing Guide: Day 4

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 3  *See notes for leading classroom discussion below* | Full class |
| Notebook Checks | During class |
| Homework:  *Outline Chapter 13* | TONIGHT |

# Pacing Guide: Day 5

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 3, continued | Full class |
| Notebook Checks | During class |
| Homework:  *Read and highlight Chapter 8 of Barron’s* (OPTIONAL) | TONIGHT |

# Pacing Guide: Day 6

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 4 | Full class |
| Grade student outlines | During class |
| Homework:  *Take the Chapter 8 exam in Barron’s review book. Grade your answers.* (OPTIONAL) | TONIGHT |

# Pacing Guide: Day 7

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 5 (OPTIONAL) | Full class |
| Check Barron’s Review books for highlighting, note taking, and practice test completion and correction. (OPTIONAL) | During class |

# Pacing Guide: Day 8

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 5, continued (OPTIONAL) | Full class |
| Check Barron’s Review books for highlighting, note taking, and practice test completion and correction. (OPTIONAL) | During class |

# Pacing Guide: Day 9

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 6 | Full class |
| Check Barron’s Review books for highlighting, note taking, and practice test completion and correction. (OPTIONAL) | During class |
| Homework:  *Correct all homework & classwork assignments for resubmission and grading* | TONIGHT |

# Pacing Guide: Day 10

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 7 | Full class |
| Homework:  *Correct all homework & classwork assignments for resubmission and grading* | TONIGHT |

# Pacing Guide: Day 11

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 8 | Full class |
| Re-grade corrected assignments | During class |

# Pacing Guide: Day 12

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 9 | Full class |
| Re-grade corrected assignments | During class |

# Pacing Guide: Day 13

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 9, continued | Full class |
| Re-grade corrected assignments | During class |
| Homework:  *Submit 5 questions via electronic survey for test review* | TONIGHT |

# Pacing Guide: Day 14

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 10 (OPTIONAL) | Full class |
| Re-grade corrected assignments | During class |

# Pacing Guide: Day 15

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 11 (OPTIONAL) | Full class |

# Pacing Guide: Day 16

|  |  |
| --- | --- |
| Section | Total Time |
| Student Activity 11 (OPTIONAL) | Full class |

# Procedure

*All guides, sample code, answer code, and example code may be found in the folder “Milestone 3 Elevens 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.

## About Barron’s

* + - Barron’s is an AP CS A review book that some schools provide students. If your school doesn’t provide Barron’s there are many alternative homework assignments that can be found at codingbat.com/java or practice-it.
    - Alternatively, you can save time spent on the lab by checking activities as homework.

## Notes for Introduction Lecture for Activity 3

1. The teacher’s guide recommends leading the activity with a discussion on what makes a good shuffling algorithm.

* + - * The Collections class has a method called shuffle that accepts a list as its parameter, and rearranges its elements randomly:

Collections.shuffle(list); 🡨 where list is the name of the array you want to shuffle

* + - * Ask students what System.out.println method they could call to get the top card (or first element) of the array.

System.out.println(“Top card = “ + list.get(0));

# Accommodation and Differentiation

Each day that you begin the lab, start with a quick survey of student concerns and questions. 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).

* + - * Adaptations for group work can be found on page 17 of the Teacher’s guide.

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 lab, skip lessons marked as optional.

Encourage advanced students to work through the optional lab activities. Otherwise, these students can serve as student TAs, helping others when they get stuck on code. Remind student TAs not to give answers directly, but to ask leading questions and modeling solutions to similar problems.