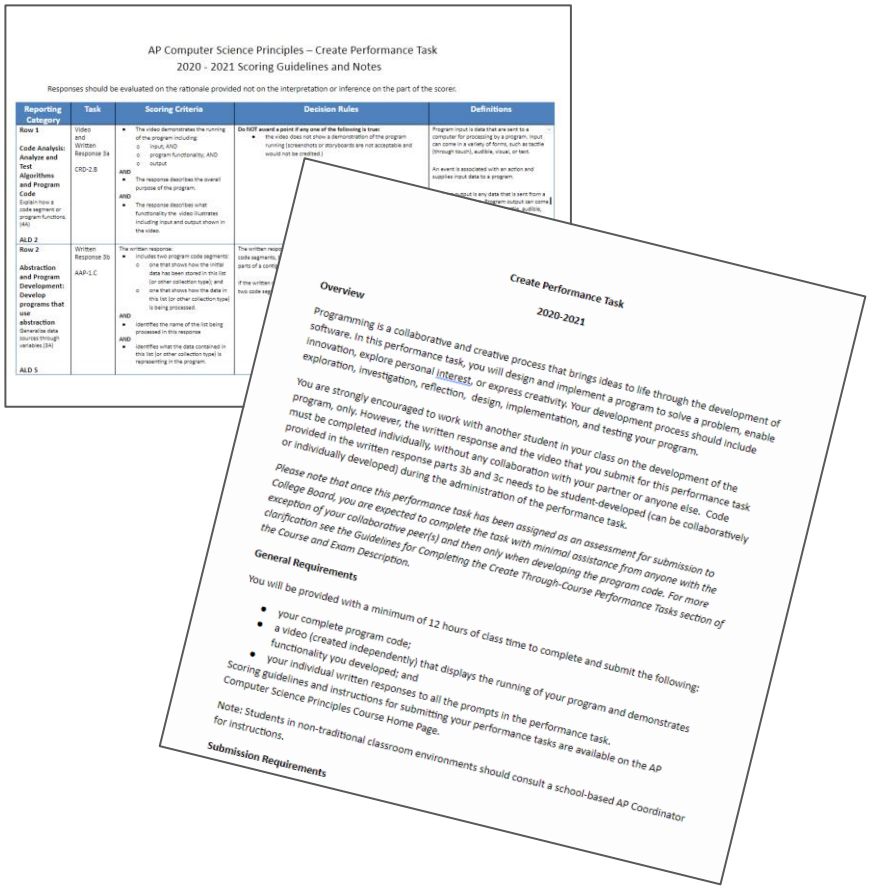
Unit 8: Create PT Prep

Lesson 1: Create PT - Review the Task
Lesson 2: Create PT - Make a Plan
Lesson 3: Create PT - Complete the Task

Unit 8 - Lesson 1
Create PT - Review the Task

Warm Up



AP Computer Science Principles – Create Performance Task
2020 - 2021 Scoring Guidelines and Notes

Responses should be evaluated on the rationale provided not on the interpretation or inference on the part of the scorer.

Reporting Category	Task	Scoring Criteria	Decision Rules	Definitions
Row 1 **Code Analysis: Analyze and Test Algorithms and Program Code** Explain how a code segment or program functions. (4A) **ALD 2**	Video and Written Response 3a CRD-2.B	• The video demonstrates the running of the program including: o input; AND o program functionality; AND o output AND • The response describes the overall purpose of the program. AND • The response describes what functionality the video illustrates including input and output shown in the video.	**Do NOT award a point if any one of the following is true:** • the video does not show a demonstration of the program running (screenshots or storyboards are not acceptable and would not be credited.)	Program input is data that are sent to a computer for processing by a program. Input can come in a variety of forms, such as tactile (through touch), audible, visual, or text. An event is associated with an action and supplies input data to a program. Program output is any data that is sent from a program. Program output can come in a variety of forms, such as tactile, audible, visual, or text.
Row 2 **Abstraction and Program Development: Develop programs that use abstraction** Generalize data sources through variables (3A) **ALD 5**	Written Response 3b AAP-1.C	The written response: • includes two program code segments: o one that shows how the initial data has been stored in this list (or other collection type); and o one that shows how the data in this list (or other collection type) is being processed. AND • identifies the name of the list being processed in this response AND • identifies what the data contained in this list (or other collection type) is representing in the program.	The written response: code segments, parts of a conti If the written two code se	

Create Performance Task

2020-2021

Overview

Programming is a collaborative and creative process that brings ideas to life through the development of software. In this performance task, you will design and implement a program to solve a problem, enable innovation, explore personal interest, or express creativity. Your development process should include exploration, investigation, reflection, design, implementation, and testing your program.

You are strongly encouraged to work with another student in your class on the development of the program, only. However, the written response and the video that you submit for this performance task must be completed individually, without any collaboration with your partner or anyone else. Code provided in the written response parts 3b and 3c needs to be student-developed (can be collaboratively or individually developed) during the administration of the performance task.

Please note that once this performance task has been assigned as an assessment for submission to College Board, you are expected to complete the task with minimal assistance from anyone with the exception of your collaborative peer(s) and then only when developing the program code. For more clarification see the Guidelines for Completing the Create Through-Course Performance Tasks section of the Course and Exam Description.

General Requirements

You will be provided with a minimum of 12 hours of class time to complete and submit the following:

- your complete program code;
- a video (created independently) that displays the running of your program and demonstrates functionality you developed; and
- your individual written responses to all the prompts in the performance task.

Scoring guidelines and instructions for submitting your performance tasks are available on the AP Computer Science Principles Course Home Page.

Note: Students in non-traditional classroom environments should consult a school-based AP Coordinator for instructions.

Submission Requirements

Distribute:

Scoring Guidelines
Task Instructions

Prompt: Read and then discuss with a partner the Scoring Guidelines and Task Instructions. For the Scoring Guidelines, you can focus on only the first 3 columns for now: "Reporting Category", "Task", "Scoring Criteria". We'll dive into the decision rules later. Just get familiar with these documents.

After reading discuss with a partner:

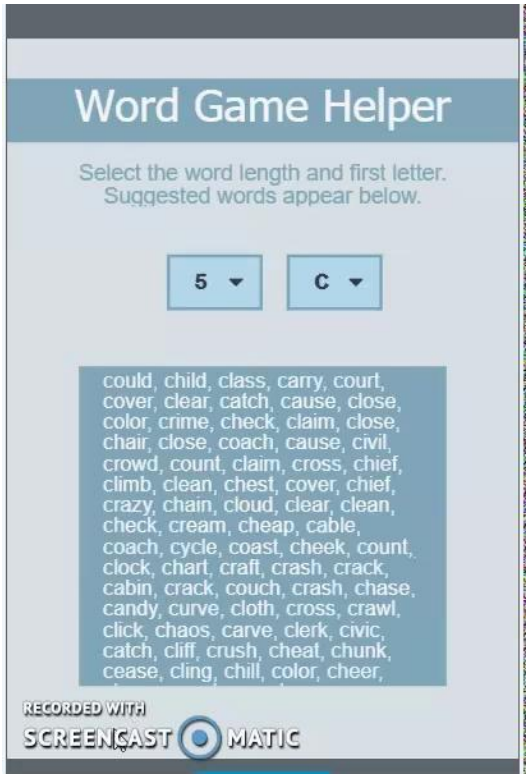
- What will you *actually* be turning in to the College Board?
- What are you hoping will become more clear after looking at example projects?

You will need to submit:

- Video showing your program's main functionality, including input and output
- A PDF of your program code
- A PDF Written Response

Activity

Create PT Sample 1 - Video



3a. Provide a written response that:

- describes the overall purpose of the program; and
- describes what functionality the video illustrates; and
- describes the input and output shown in the video

The purpose of the Word Game Helper app is to assist users in finding words to help in various games like scrabble or crossword puzzles. The video shows how the user selects the length of the word and the first letter from different dropdowns. The user inputs a value to the program using the dropdowns. The output, which is a list of words that meet the chosen conditions, is displayed on the screen.

3b. Capture and paste two program code segments you developed during the administration of this task which contain a list (or other collection type) being used in your program. The first program code segment must show how data has been stored in the list. The second program code segment must show the data in the same list being processed, such as creating new data from the existing data. Then, provide a written response that:

- identifies the name of the list being processed in this response; and
- identifies what the data contained in the list is representing in your program; and
- explains how the selected list manages complexity in your program by explaining how your program code would be written differently without using this list

Code Segment #1

```
1  var wordList = getColumn("words", "Word");
```

Code Segment #2

```
15 function filter(len, letter){
16   showElement("waitingImage");
17   filteredWordList = [];
18   setText("output", "");
19
20   for(var i=0; i<wordList.length; i++){
21     if(wordList[i].length == len && wordList[i].substring(0,1)==letter){
22         appendItem(filteredWordList, wordList[i]);
23     }
24   }
25
26   if(filteredWordList.length == 0){
27     appendItem(filteredWordList, "No Options Available");
28   }
29
30   hideElement("waitingImage");
31   setText("output", filteredWordList.join(", "));
32 }
```

Distribute:

Create PT Sample 1 Written Response

3a. Provide a written response that:

- describes the overall purpose of the program; and
- describes what functionality the video illustrates; and
- describes the input and output shown in the video

The purpose of the Word Game Helper app is to assist users in finding words to help in various games like scrabble or crossword puzzles. The video shows how the user selects the length of the word and the first letter from different dropdowns. The user inputs a value to the program using the dropdowns. The output, which is a list of words that meet the chosen conditions, is displayed on the screen.

3b. Capture and paste two program code segments you developed during the administration of this task which contain a list (or other collection type) being used in your program. The first program code segment must show how data has been stored in the list. The second program code segment must show the data in the same list being processed, such as creating new data from the existing data. Then, provide a written response that:

- identifies the name of the list being processed in this response; and
- identifies what the data contained in the list is representing in your program; and
- explains how the selected list manages complexity in your program by explaining how your program code would be written differently without using this list

Code Segment #1

```
1  var wordList = getColumn("words", "Word");
```

Code Segment #2

```
15 function filter(len, letter){
16   showElement("waitingImage");
17   filteredWordList = [];
18   setText("output", "");
19
20   for(var i=0; i<wordList.length; i++){
21     if(wordList[i].length == len && wordList[i].substring(0,1)==letter){
22         appendItem(filteredWordList, wordList[i]);
23     }
24   }
25
26   if(filteredWordList.length == 0){
27     appendItem(filteredWordList, "No Options Available");
28   }
29
30   hideElement("waitingImage");
31   setText("output", filteredWordList.join(", "));
32 }
```

Prompt:

This is a Written Response for the Create PT. Read it to yourself first. Then with your partner spend a few minutes reviewing it.

Be ready to share out the following answers:

- Did anything surprise you in looking at this sample?
- Do you think this scored well based on what you know about the scoring guidelines?

Distribute:

Create PT
Annotated Sample 1

Student Response	Scoring Guidelines	
	Row and Task	Decision Rules
 *The purpose of the Word Game Helper app is to assist users in finding words to help in various games like scrabble or crossword puzzles. The video shows how the user selects the length of the word and the first letter from different dropdowns. The user inputs a value to the program using the dropdowns. The output, which is a list of words that meet the chosen conditions, is displayed on the screen.*	**Row 1** **Video and Written Response 3a** CRD-2B • The video demonstrates the running of the program including: ○ input; AND ○ program functionality; AND ○ output AND • The response describes the overall purpose of the program. AND • The response describes what functionality the video illustrates including input and output shown in the video.	**Do NOT award a point if any of the following is true:** • the video does not show a demonstration of the program running (screenshots or storyboards are not acceptable and would not be credited.)
	The response earned the point for this row. The response describes the purpose of the app is "to assist users in finding words to help in various games..." Input and output are shown in the video and described in the response as dropdowns and "list of words...displayed on the screen."	

<table>
<tr><th>Student Response</th><th colspan="2">Scoring Guidelines</th></tr>
<tr><td rowspan="2"> 

The purpose of the Word Game Helper app is to assist users in finding words to help in various games like scrabble or crossword puzzles. The video shows how the user selects the length of the word and the first letter from different dropdowns. The user inputs a value to the program using the dropdowns. The output, which is a list of words that meet the chosen conditions, is displayed on the screen.</td><th>Row and Task</th><th>Decision Rules</th></tr>
<tr><td>Row 1
Video and Written Response 3a

CRD-2B

• The video demonstrates the running of the program including:
○ input; AND
○ program functionality; AND
○ output
AND
• The response describes the overall purpose of the program.
AND
• The response describes what functionality the video illustrates including input and output shown in the video.</td><td>Do NOT award a point if any of the following is true:
• the video does not show a demonstration of the program running (screenshots or storyboards are not acceptable and would not be credited.)</td></tr>
<tr><td colspan="3">The response earned the point for this row.
The response describes the purpose of the app is "to assist users in finding words to help in various games…" Input and output are shown in the video and described in the response as dropdowns and "list of words…displayed on the screen."</td></tr>
</table>

Prompt:

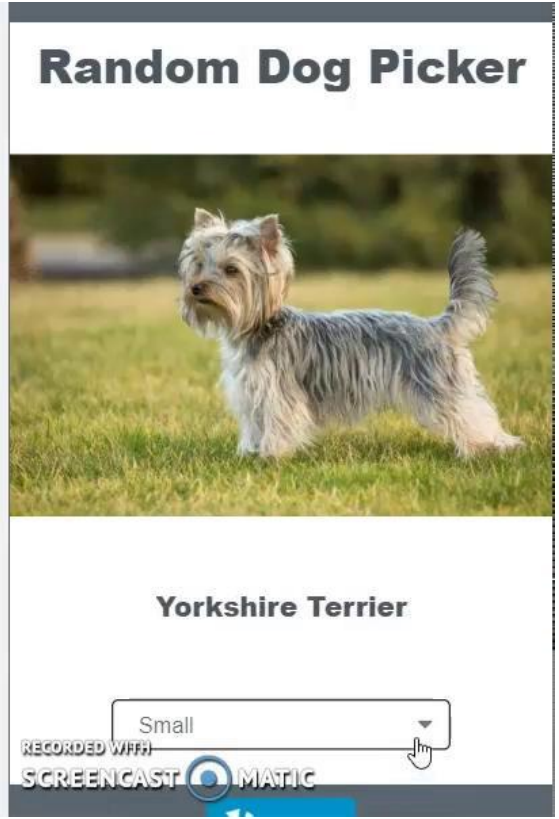
With your partner look over this annotated version of the sample to see how each row of the scoring guidelines was applied. You should be reading specifically to answer any of the questions you had about the task earlier.

After looking it over we will discuss:

- What characteristics of this response made it score well?
- What parts confused you?
- What questions do you still have about the Scoring Guidelines or Task description?

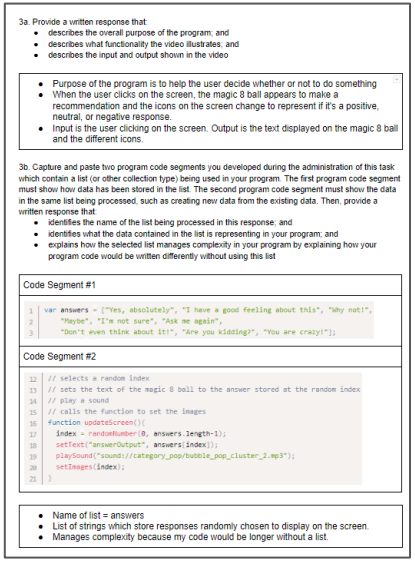
Sample 2:

Magic 8 Ball App



Sample 3:

Random Dog Picker App



3a. Provide a written response that:
- describes the overall purpose of the program; and
- describes what functionality the video illustrates; and
- describes the input and output shown in the video

- Purpose of the program is to help the user decide whether or not to do something
- When the user clicks on the screen, the magic 8 ball appears to make a recommendation and the icons on the screen change to represent if it's a positive, neutral, or negative response.
- Input is the user clicking on the screen. Output is the text displayed on the magic 8 ball and the different icons.

3b. Capture and paste two program code segments you developed during the administration of this task which contain a list (or other collection type) being used in your program. The first program code segment must show how data has been stored in the list. The second program code segment must show the data in the same list being processed, such as creating new data from the existing data. Then, provide a written response that:
- identifies the name of the list being processed in this response; and
- identifies what the data contained in the list is representing in your program; and
- explains how the selected list manages complexity in your program by explaining how your program code would be written differently without using this list

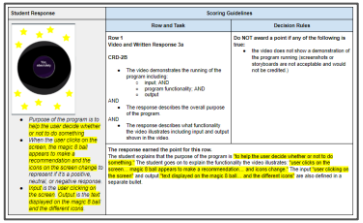
Code Segment #1

```
var answers = ["Yes, absolutely", "I have a good feeling about this", "Why not!",
    "Maybe", "I'm not sure", "Ask me again",
    "Don't even think about it!", "Are you kidding?", "You are crazy!"];
```

Code Segment #2

```
// selects a random index
// sets the text of the magic 8 ball to the answer stored at the random index
// play a sound
// calls the function to set the images
function updateScreen(){
  index = randomNumber(0, answers.length-1);
  setText("answerOutput", answers[index]);
  playSound("sound://category_pop/bubble_pop_cluster_2.mp3");
  setImages(index);
}
```

- Name of list = answers
- List of strings which store responses randomly chosen to display on the screen.
- Manages complexity because my code would be longer without a list.



Student Response

Scoring Guidelines

Row and Task | Decision Rules

Row 1
Video and Written Response 3a

CRD-2B

- The video demonstrates the running of the program including:
  - input; AND
  - program functionality; AND
  - output

AND

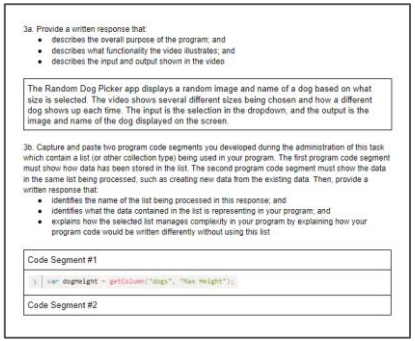
- The response describes the overall purpose of the program.

AND

- The response describes what functionality the video illustrates including input and output shown in the video

Do NOT award a point if any of the following is true:
- the video does not show a demonstration of the program running (screenshots or storyboards are not acceptable and would not be credible.)

The response earned the point for this row.



3a. Provide a written response that:
- describes the overall purpose of the program; and
- describes what functionality the video illustrates; and
- describes the input and output shown in the video

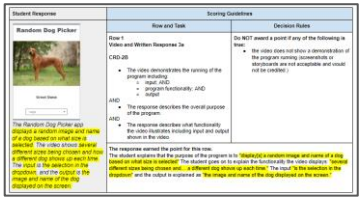
The Random Dog Picker app displays a random image and name of a dog based on what size is selected. The video shows several different sizes being chosen and how a different dog shows up each time. The input is the selection in the dropdown, and the output is the image and name of the dog displayed on the screen.

3b. Capture and paste two program code segments you developed during the administration of this task which contain a list (or other collection type) being used in your program. The first program code segment must show how data has been stored in the list. The second program code segment must show the data in the same list being processed, such as creating new data from the existing data. Then, provide a written response that:
- identifies the name of the list being processed in this response; and
- identifies what the data contained in the list is representing in your program; and
- explains how the selected list manages complexity in your program by explaining how your program code would be written differently without using this list

Code Segment #1

```
var dogHeight = getColumn("Dogs", "Max Height");
```

Code Segment #2



Student Response

Scoring Guidelines

Row and Task | Decision Rules

Row 1
Video and Written Response 3a

CRD-2B

- The video demonstrates the running of the program including:
  - input; AND
  - program functionality; AND
  - output

AND

- The response describes the overall purpose of the program.

AND

- The response describes what functionality the video illustrates including input and output shown in the video

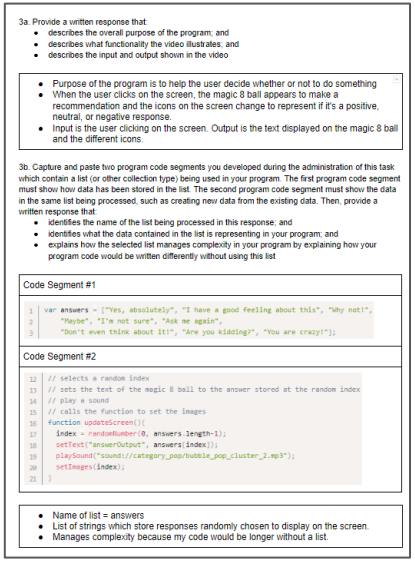
Do NOT award a point if any of the following is true:
- the video does not show a demonstration of the program running (screenshots or storyboards are not acceptable and would not be credible.)

The response earned the point for this row.

Distribute:

Create PT Annotated Sample 2
Create PT Written Response Sample 2

Create PT Annotated Sample 3
Create PT Written Response Sample 3



3a. Provide a written response that:

- describes the overall purpose of the program; and
- describes what functionality the video illustrates; and
- describes the input and output shown in the video

- Purpose of the program is to help the user decide whether or not to do something
- When the user clicks on the screen, the magic 8 ball appears to make a recommendation and the icons on the screen change to represent if it's a positive, neutral, or negative response.
- Input is the user clicking on the screen. Output is the text displayed on the magic 8 ball and the different icons.

3b. Capture and paste two program code segments you developed during the administration of this task which contain a list (or other collection type) being used in your program. The first program code segment must show how data has been stored in the list. The second program code segment must show the data in the same list being processed, such as creating new data from the existing data. Then, provide a written response that:

- identifies the name of the list being processed in this response; and
- identifies what the data contained in the list is representing in your program; and
- explains how the selected list manages complexity in your program by explaining how your program code would be written differently without using this list

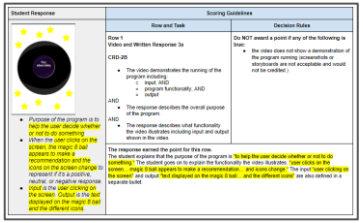
Code Segment #1

```
var answers = ["Yes, absolutely", "I have a good feeling about this", "Why not!",
  "Maybe", "I'm not sure", "Ask me again",
  "Don't even think about it!", "Are you kidding?", "You are crazy!"];
```

Code Segment #2

```
// selects a random index
// sets the text of the magic 8 ball to the answer stored at the random index
// play a sound
// calls the function to set the images
function updateScreen(){
  index = randomNumber(0, answers.length-1);
  setText("answerOutput", answers[index]);
  playSound("sound://category_pop/bubble_pop_cluster_2.mp3");
  setImages(index);
}
```

- Name of list = answers
- List of strings which store responses randomly chosen to display on the screen.
- Manages complexity because my code would be longer without a list.



Student Response

Scoring Guidelines

Row and Task

Decision Rules

Row 1
Video and Written Response 3a

CRD-2B

- The video demonstrates the running of the program including:
  - input; AND
  - program functionality; AND
  - output

AND

- The response describes the overall purpose of the program.

AND

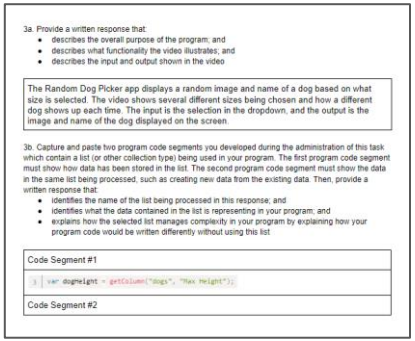
- The response describes what functionality the video illustrates including input and output shown in the video

Do NOT award a point if any of the following is true:

- the video does not show a demonstration of the program running (screenshots or storyboards are not acceptable and would not be credible.)

- *Purpose of the program is to help the user decide whether or not to do something*
- *When the user clicks on the screen, the magic 8 ball appears to make a recommendation and the icons on the screen change to represent if it's a positive, neutral, or negative response.*
- *Input is the user clicking on the screen. Output is the text displayed on the magic 8 ball and the different icons*

The response earned the point for this row.
The student explains that the purpose of the program is *"to help the user decide whether or not to do something."* The student goes on to explain the functionality the video illustrates *"user clicks on the screen... magic 8 ball appears to make a recommendation... and icons change."* The input *"user clicking on the screen"* and output *"text displayed on the magic 8 ball... and the different icons"* are also defined in a separate bullet.



3a. Provide a written response that:

- describes the overall purpose of the program; and
- describes what functionality the video illustrates; and
- describes the input and output shown in the video

The Random Dog Picker app displays a random image and name of a dog based on what size is selected. The video shows several different sizes being chosen and how a different dog shows up each time. The input is the selection in the dropdown, and the output is the image and name of the dog displayed on the screen.

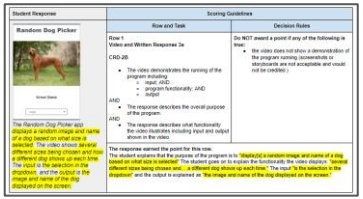
3b. Capture and paste two program code segments you developed during the administration of this task which contain a list (or other collection type) being used in your program. The first program code segment must show how data has been stored in the list. The second program code segment must show the data in the same list being processed, such as creating new data from the existing data. Then, provide a written response that:

- identifies the name of the list being processed in this response; and
- identifies what the data contained in the list is representing in your program; and
- explains how the selected list manages complexity in your program by explaining how your program code would be written differently without using this list

Code Segment #1

```
var dogHeight = getColumn("Dogs", "Max Height");
```

Code Segment #2



Student Response

Scoring Guidelines

Random Dog Picker

Row and Task

Decision Rules

Row 1
Video and Written Response 3a

CRD-2B

- The video demonstrates the running of the program including:
  - input; AND
  - program functionality; AND
  - output

AND

- The response describes the overall purpose of the program.

AND

- The response describes what functionality the video illustrates including input and output shown in the video

Do NOT award a point if any of the following is true:

- the video does not show a demonstration of the program running (screenshots or storyboards are not acceptable and would not be credible.)

The Random Dog Picker app displays a random image and name of a dog based on what size is selected. The video shows several different sizes being chosen and how a different dog shows up each time. The input is the selection in the dropdown, and the output is the image and name of the dog displayed on the screen.

The response earned the point for this row.
The student explains that the purpose of the program is to *"display [a] a random image and name of a dog based on what size is selected."* The student goes on to explain the functionality the video displays *"several different sizes being chosen and... a different dog shows up each time."* The input *"is the selection in the dropdown"* and the output is explained as *"the image and name of the dog displayed on the screen."*

Prompt:

With your partner, look at these samples - you can pick which to look at first. As you review this task with a partner ask yourself:

- Where an how specifically did this fall short?
- Was there one major problem that caused ripple effects through the scoring?
- Or were there several smaller issues?
- Try to point out specific aspects of the Scoring Guidelines or Submission Requirements.

Do This:

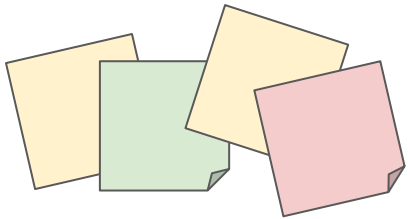
Go back to Create PT Annotated Sample 2. With a partner, discuss how you could rewrite response 3b in order to earn the point.

Wrap Up

Prompt:

Based on the examples that you saw today write down on separate post-its:

- The number one piece of advice you have for the Create PT
- One "gotcha" to look out for
- One question you'd still like answered about the Create PT



Unit 8 - Lesson 2
Create PT - Make a Plan

Warm Up

Prompt:

Based on our review of the Create PT yesterday...

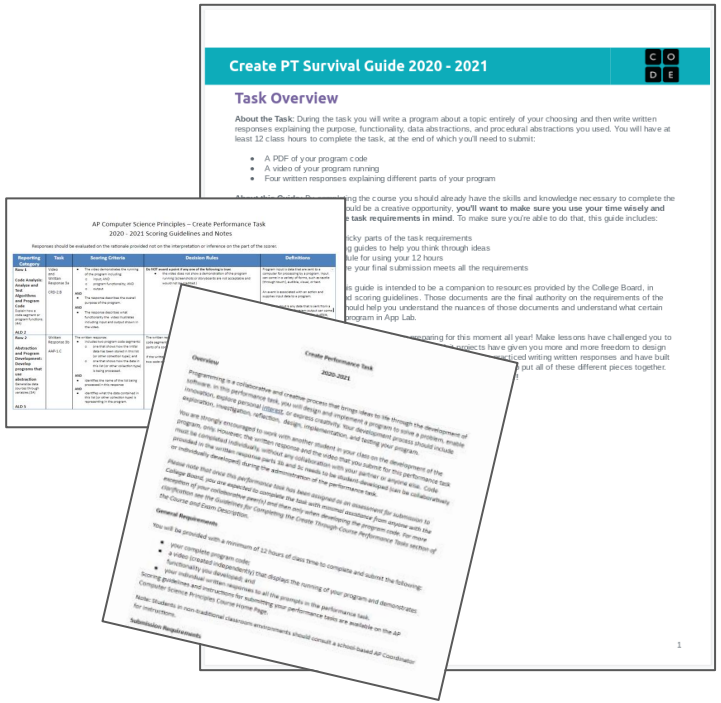
What are the main things you have to do for the Create PT?

What should you do first?

Activity

What you'll need:

- Create PT Survival Guide
- (Optional)
  - Task Directions
  - Scoring Guidelines



Task Overview (page 1) - 5 mins

- Read this page
- Any high level questions?

What is Required of My Program? (page 2) - 5 mins

- Read this page
- Any questions on the 4 takeaways?

Function Requirement Activity 1 - Does It Count? (pages 3 - 4) - 15 mins

- Review the scoring guidelines on page 3
- Decide if the functions on page 4 should be awarded each point
- Be ready to discuss your reasons

Function Requirement Activity 2 - Two Function Calls (pages 5) - 10 mins

- Practice response 3d by coming up with 2 different calls to each function
- Be ready to talk through what you learned from this activity

Narrow It Down (page 6) - 5 mins

- Read the section called "Narrow It Down"
- Any questions about what it means to narrow down a project?

Practice Narrowing It Down (page 6-7) - 10 mins

- You and a partner should pick one example project and brainstorm ways that student could narrow down their idea
- Be prepared to share your responses with the class

Choosing a Project Idea (page 8) - 5 mins

- Read this page
- Any questions about how to choose a project idea?

Brainstorm Ideas (page 8) - 10 mins

- Spend 5 minutes brainstorming two project ideas you could do for the Create PT
- Spend 5 minutes discussing your ideas with a partner and getting feedback.

Wrap Up

Create PT Written Response Organizer (page 9) - 5 mins

- Review this organizer
- You should use the organizer throughout this project to make sure you have all the components you need.

Create PT Completion Timeline (page 10) - 5 mins

- Review this calendar
- What do you notice about how the schedule recommends you spend your time?

Unit 8 - Lesson 3
Create PT - Complete the Task

Warm Up

Prompt: Read page 12-13: Preparing for the Performance Task.

This is a general checklist of things you should do to prepare for the AP Performance Task. Let's see how we did. With a partner - one person reading from the top down, the other reading from the bottom up - check off things we've done to prepare so far. Identify anything we haven't' done.

Discuss together before discussing as a class.

Prompt: Read page 11: AP Computer Science Principles Policy on Plagiarism

With a partner carefully read this section.

Discuss together before discussing as a class.

Examples:

- If you use a library that someone else created, you need to include a comment citing this source as code you yourself did not write.
- If using images, media, or other copyrighted material found on the web, you should cite those sources in comments in your program code - usually at the top. Something like:

```
// The images used in this app came from:
// [1] bird image - http://name-of-site.com/path/to/image.jpg
// [2] flower image - http://site.com/path/to/flower.jpg
```

Prompt: Read page 14-15: Completing the Create Performance Task.

This is a list of final Do's and Don'ts for the Create PT. With your partner, read the **You must, You may not,** and **You may** sections of this page. Then with your partner summarize:

What kinds of things can your teacher help you with?

Do This:

- Take out your Create PT timeline that we developed and review.
- Ask any remaining questions.
- Review the overall timeline for the task.

The official PT time is about to start!

Activity

GO! Complete the Create Performance Task

Note: You can find resources for completing the task on Code Studio.

Wrap Up

Submit the Create Performance Task

- You are encouraged to submit and save work in the AP digital portfolio as you go!
- Before submitting final:
  - Check over the Survival Guide checklists to make sure you met all the requirements
  - Make sure you have all three components finished.
- At the designated end of the Task administration submit the three items to your AP Portfolio:
  - Video
  - Written Responses
  - Program Code