Lesson: Variables (Phase 1, Lesson 2)
Time: 2:00 hours
Class size: 10 students

Variables: Lesson Example

Milestone Objective	By the end of this lesson, students should be able to declare a variable and use variables in a statement.		
Focus(es) of this Lesson	1. Students will be able to understand key terms related to variables 2. Students will be able to identify variables in code 3. Students will be able to debug variable related syntax errors 4. Students will be able to declare variables using proper syntax	Assessments Include Focus being addressed	A1: Classify Bricks (F1) A2: Model Object (F1) A3: Vocab fill-out (F1-3) A4: Identify Variables in Code (F2) A5: Syntax Debug (F3) A6: Declare Variables (F2-4)
Materials & Resources	a. Bags of 20 assorted lego bricks (5) b. Dry-erase board c. Markers d. Paper (10) e. Writing utensils f. Personal Object (10) g. Code example of good variable use h. Internet access i. Laptops (10) j. Online chatroom for students to share ideas (Slack) k. Vocabulary cheat sheet with blanks (10) l. Syntax websites (10) m. Declare and add 2 variables prompt		
Prior Knowledge	1. Know how to use Slack and have a slack account set up 2. How to access a code editor 3. How to use search engines 4. Basic understanding of Algebraic concepts (x is a variable, x+y=z, and so on)		

Instructional Procedures/Steps

Note when you are addressing a learning objective and when enacting an assessment.

	Teacher will… Instructional procedure, questions you will ask, checks for understanding, transitions, and evidence of culturally responsive teaching practices.	Student will… What will students be doing? What evidence of learning will students demonstrate? Student-centered learning/opportunities for practice and application.

Opening ____10____ Minutes	*Prior to students entering the room, the teacher will have bags of legos places on 5 desks.*
	
	1. LEGO variable identification (A1) 10 minutes
	In slack, the teacher will post the prompt
	   A. With your partner, list as many descriptors of the legos as you can. Specifically, find at least 10 different classifications for the legos
	Teacher will time 5 minutes, and walk around the room checking that students are logged on and working. Teacher will take attendance and answer student questions from a prior lesson if applicable. Teacher will give a 1 minute warning.
	
	Teacher will use a count-up to get students refocused. Teacher will ask groups how many variables about the LEGOs they could find. Teacher will copy variables onto the dry-erase board.
		Students will bring in a personal object from home with them as they enter the room.
		
		1. LEGO variable identification
		Students will move to their desks, log onto slack, and begin working on the posted assignment.
		   A. Longer than 4 dots, taller than one unit, smooth surface, warm color, rectangular, circular…
		
		Students will work in pairs to generate a list of variables about their objects, the LEGOs. Students will ask questions if necessary.
		
		Students will refocus on the whole class setting, and will share their variables with the class. Students will add to the list of variables.

Instruction ____45____ Minutes	**2. Variables Instruction** 5 minutes Teacher will pull up a text editor on their screen. Teacher will show students how to declare variables on the screen using the lego variables as examples. **3. Lesson Overview** (2 minutes) Instructor will ask students to check their slack, and will read through the plan for the day's lesson Objective: You'll be able to define variables with proper syntax by the end of the lesson.	**2. Variables Instruction** Students will observe as instructor declares objects on their screen. **3. Lesson Overview** Students will ask questions as needed about the lesson overview.

	a. Opening
	b. Defining your object*
	c. Find 3 examples of variable definitions in existing code*
	d. Vocab definitions
	e. Syntax debug
	f. Break
	g. Solo work: Sorting by variables*
	h. Exit slip
	
	4. Object definition (A2) 5 minutes
	Instructor will ask students to copy syntax, but define variables based on their personal object they brought.
	   A. Define your personal object in a text editor
	
	Instructor will ask students to raise hands when their at an asterisk, and will come by to check their work.
		4. Object definition (A2)
		Students will define their own objects they brought in based on it's variables using the syntax from the front of the room.
		   A. "class ActionFigure {
		     Colors: ["Blue", "Red", "Yellow"],
		     Height: 5",
		     Weight: 4oz,
		     Name: "Power Rangerz"
		  }"
		
		From this point forward, students will work through the overview, checking in with the instructor at each astrix in the overview.

Break ____10____ Minutes	**6. Break** Instructor will continue to work with students who are struggling if need be. Instructor will give a clear time to return and refocus. Instructor will pass out vocab sheets during the break to each station.	**6. Break** Students will use the 10 minutes to refocus, recharge, use the bathroom, and ask questions if need be. They will return to their stations at the declared end of the break.
Instruction ____45____ Minutes	**7. Refocus (A3)** 5 minutes Instructor will ask students to look at the definition sheets in front of them. There will be missing text that the instructor will ask students to fill in. **8. Identify Variables in Code (A4)** 10 minutes	**7. Refocus (A3)** Students will fill in text blanks related to key vocab words. Students will keep this sheet if they'd like, but they will have access to a online file there as well. **8. Identify Variables in Code**

	Instructor will be available for student questions in this segment. Instructor will have prepared lines of code for students to analyze, and will have it available in a text editor file. Instructor will ask students to identify the variables in the lines of code. **9. Syntax Debug (A5)** 20 minutes Instructor will have an example of code with correct syntax, followed by code with incorrect syntax. Instructor will move around the room asking students if they think their code is correct, and why or why not. Instructor will help them work through any roadblocks by asking them questions moving up Bloom's Taxonomy **10. Declare Variables (A6)** 15 minutes Instructor will have prepared a list of objects and ask students to define them.	Students will analyze lines of code to identify variables. Students will identify how the variables are defined in syntax, as well as what a variable is in the text. Students will use the space provided in the text editor to show their work. **9. Syntax Debug** Students analyze a good example of syntax for key components that make the code work. will fix the syntax in multiple examples. This will be scaffolded to students writing the lines of code entirely on their own. **10. Declare Variables** Students will define a set of objects by their variables using proper syntax. Students will check each other's work if time permits.
Closing ____5____ Minutes	**11. KWQ** Instructor will ask students to post something the learned, something they want to learn now that they understand variables, and something they have questions about in the group chat. Instructor will ask students to scan the group chat and answer another question a peer posed to the class.	**11. KWQ** Students will post something they learned, something they want to learn, and a question they have in the group chat. Students will scan the group chat over the next 48 hours to see if there's a student question they can answer.
Modifications/ Accommodations/ Enrichment	If students blow through the lesson, they will be asked to investigate class inheritance. Although this will come up in a future lesson, an understanding of this will enhance their ability to work with code. Specifically, we will ask students to "write lines of code that demonstrate an understanding of class inheritance" If a student is struggling with a concept, the instructor will help them during the lesson. If they are still unable to grasp the concept, they will be referred to a mentor, and be provided the opportunity to ask their questions in the class group chat.	