

ELA Lesson Plan #5

Lesson Title	LESSON 5: Various Variables	Class Level/ GLE	Intermediate (Pre-ASE)/ 4-8 GLE (STAR)
Unit Title	Various Variables: Using Scientific Thinking to Solve Real-Life Problems	Teacher Name	Christina Cronin

CCRS AE <i>(use notation & shorthand)</i>	ELA Learning Objectives By the end of this lesson, students will be able to:	Evidence of Learning Students will show their learning by:
L6C/D: Acquire and use accurately level-appropriate general academic and domain-specific words and phrases.	Apply word meanings for 5 vocabulary words	Making edits to their Knowledge Rating Scales after exposure to vocabulary definitions. Accurately identifying the 3 types of variables on their final Jamboard frame.
R3C: Explain events, procedures, ideas, or concepts in a historical, scientific , or technical text, including what happened and why, based on specific information in the text .	Use annotation and text patterns to identify the 3 types of variables (independent, dependent, and controlled) and how they interact within different scenarios about scientific events	Their use of text markings, highlights, and other annotations to accurately identify the 3 types of variables on the final Jamboard frame.
RF3B/C: Know and apply grade-level phonics and word analysis skills in decoding words. (Alphabetics)	Apply knowledge of the <i>-im</i> and <i>-in</i> prefixes to spell and discern the meaning of words	Accurately completing Prefix Quizizz for Im- and In- .
RF4C/D: Read with sufficient accuracy and fluency to support comprehension. (Fluency)	Read text, showing improvement in accuracy, rate, and prosody	Selecting 1-2 areas on the Fluency Checklist to focus on before oral reading, and self-assessing those areas and/or being assessed by the teacher, using the same checklist.

Student Texts and Other Resources

- Include authentic print and/or digital texts that are appropriate for adults.
- Include texts that accurately and respectfully represent diverse identities, cultures, and perspectives.
- Include text complexity level for each text.
- List instructional videos, websites, and handouts for students.
- Include hyperlinks.

Alphabetics

- Quiz: Prefix *-im* and *-in*
 - [Independent Practice with In- and Im-](#) [Quizizz is free for teachers to use with students. Once you set up a free account, you can do a search for the exercise entitled “Prefix im- and in-”.]
 - [Paper version w/answer key](#)

(Additional Alphabetics Practice):

- [Negative Prefixes](#)
- [Negative Prefixes \(higher level\)](#)

Vocabulary

- [Knowledge Rating Scale](#)
- [Vocabulary Quadrant Charts \(TEACHER\)](#)
- [Vocabulary Quadrant Charts \(STUDENTS\)](#)
- Video: [Variables in Science?: Independent, Dependent, and Controlled Variables](#)

Fluency

- [The Types of Variables](#) (GLE 5/6; Newsela.com)
- [Science Variables](#) (GLE 9)
- [Fluency Checklist](#)

Comprehension

- Jamboard: [Experimental Variables in Science](#)

(Additional Comprehension/Vocabulary Practice):

- [Identifying Variables in Science](#) (contextualized practice at Wizer.me)
- [Experimental Design and Variables](#) (contextualized practice at Quizizz.com) / [Paper version w/answers](#)

Instructional Shifts

(Which ones are addressed in this lesson?)

X	Engage with complex text and its academic language.
X	Ground reading, writing, and speaking in evidence from literary and informational texts.
X	Build knowledge through content-rich nonfiction.

Instructional Process

Sequence and concisely describe culturally-responsive and evidence-based instruction.

- Incorporate the “I do,” “We do,” “You do” model.
- Contextualize skill instruction within authentic texts and tasks.
- Incorporate a variety of tasks and interactions that foster engagement.
- Support learners in making connections to their lives.
- Involve students in using technology to find, evaluate, consume, create, organize, communicate, and share digital content.
- Include choice and flexibility where appropriate to meet diverse needs.
- Provide additional modifications as needed for English Learners, students with learning disabilities (LD), and students at different levels.

TIME ESTIMATE: 2 hours

**TIME /
MATERIALS**

STEP-BY-STEP DIRECTIONS

**FURTHER
DIFFERENTIATION**
(e.g., EL, LD, different levels)

Warm-Up/Introduction

- Review unit goal/cumulative project.
- Review key learnings from previous lesson(s)/Activate prior knowledge.
- Introduce the objectives—and address why they are important.

(10 minutes)

[Lesson 5: Slide Deck](#)

1. Overview of the Lesson:

- Remind students that they are working on a unit on **variables**. They are in the midst of building their understanding so that they can soon create and present a **Google Slide** that presents a solution to the **Schoolmate Problem**, an authentic **health-related issue**.
- Explain that today, after the **alphabetics review/practice**, **students will learn new scientific concepts about variables**, which they will later apply to testing their solutions for the Schoolmate Problem.

2. Think/Pair/Share: Ask students to brainstorm together for just 2-3 minutes what they remember from the previous lesson regarding:

- The prefixes **im-** and **in-**
- Cause and effect statements

Ask for volunteers to report back and list thoughts on the board, paying close attention to statements such as: “I learned....

...to use the prefix “im-” before words starting with m or p.”

...the 1 cause I decide to change in my experiment needs to be something that would produce an effect that I can easily measure.”

3. Lesson Objectives: Explain that in **today’s lesson**, students will continue to build on the knowledge they acquired in the previous lesson using the prefixes **im-** and **in-**. They will also

	make connections between previous key terms and new ones related to various variables through vocabulary, fluency, and comprehension activities. [NOTE: Having a solid understanding of the different types of variables in an experiment is paramount for students, not only for understanding the variables involved in their Schoolmate Problem in the next lesson, but in real-world problem solving as well. In addition, having good comprehension of the role of various variables ties into the overall unit goal of understanding the principles of fair testing.]	
Body • Explain and model 1) the target knowledge or skill and/or 2) processes to follow to accomplish tasks. • Provide scaffolded practice and feedback. • Engage learners in inquiring, exploring, and problem-solving. • Include multiple kinds of interactions (e.g., whole group, small group, pairs). • Pose questions that require critical thinking and evidence from the text. • Use technology appropriate to the task(s).		
(15 minutes) Computers with internet for: https://Quizizz.com - Quizizz.com is free for teachers to use with students. Once you set up a free account, you can do a search for the exercise entitled "Prefix im- and in-".)	Alphabetics [RF3B/C] 1. I DO: Use the slide deck to review the meaning of the prefixes im- vs. in- ("not") and the rules for applying them to base or root words. ○ Use im- prefix before words that start with m or p ○ Use in- prefix before words that start with consonants & vowels (but not i or u) 2. WE DO: With students, work through 2 examples of adding the prefix to a base word and thinking about how the prefix changes the meaning. ○ Example: Use base words "possible" and "credible" and ask students to choose which negative prefix to put in front ("impossible," "incredible"). 3. YOU DO: Finally, using computers, allow students to try the short online individual practice on Prefixes In- and Im- (Quizizz.com; see note in left column).	Paper version of Quizizz activity for students who need it Whereas native English speakers will likely automatically apply the correct prefix (based on their knowledge of oral English), English learners may need more support in understanding which "negative" prefixes to use when. More practice is available at the links below. (This practice exercise focuses on spelling, not meaning, so have students either say the meaning of the answer or write it beside the answer if they're using a paper version.) More practice: ○ Negative Prefixes ○ Negative Prefixes (higher level)

(25 minutes) Knowledge Rating Scale *The Google Docs version can be used in remote settings. Vocab Quadrant Charts: Lesson #5 (TEACHER) Vocab Quadrant Charts: Lesson #5 (STUDENT) *The Google Docs version can be used in remote settings. VIDEO: Variables in Science: Independent, Dependent, and Controlled!	Vocabulary [L6C/D] 4. Pre-Assessment - Give students access to the Knowledge Rating Scale. Explain/review that each time students learn new vocabulary, they are going to take a couple of minutes to reflect and assess their current knowledge. - Put the first vocabulary word, vary, onto the board and pronounce it. Let students copy it onto the first column of their papers. Then, explain what each column heading means, and give students a moment to assess and place a check mark under the appropriate column as to whether they know the meaning of <i>vary</i>, have heard the word <i>vary</i> but don't know the meaning, have heard <i>vary</i> and think it has something to do with...., or have never heard the word <i>vary</i>. - Continue putting each vocabulary word (independent variable, dependent variable, controlled variable, and trial) onto the board, pronouncing it, and giving students just a few moments to complete the appropriate column. 5. I DO: Explicitly model/explain the quadrant chart for each word: Definitions, Part of Speech, Sample Sentence, and Synonyms, using the Vocab Quadrant Charts: Lesson #5 (TEACHER). Display only 1 Quadrant at a time at the front of the room using a projector, screen, or smartboard device and allow students to copy the information accurately onto their blank STUDENT Vocab Quadrant Charts: Lesson #5 (STUDENT). - Model using each word in context (with full sentences); ask questions that require the use of words (e.g., <i>One variable in my daily schedule is how my son is acting. Sometimes he does what he's supposed to quickly, but sometimes he is very slow! That can make us late, so I always have to allow extra time, just to be sure I'll be on time somewhere. What is one variable that makes your schedule hard to predict?</i>). 6. Now that students have some initial understanding of basic definitions of terms, it's time for them to use the terms in the context of a science experiment. This simplistic video connects the vocabulary terms nicely: Variables in Science: Independent, Dependent and Controlled! As students watch, ask them to: 1) keep out their vocab quadrant charts to make connections while we view (and pause) the video and 2) identify which of the vocabulary words was not mentioned in the video 7. Think/Pair/Share: Have students revisit the Knowledge Rating Scale to see if their initial understandings were accurate and/or improve upon their original definitions.	Extra copies of the teacher version of the quadrant charts can be made as an accommodation or for those absent. Use closed captions with the video to help reinforce vocab/help with processing Pre-teach or pause video and discuss terms: <i>lifespan, manipulate & constant</i>
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(20 minutes) For Teacher/Student Fluency Checklist Text: Types of Variables (GLE 5/6)	Fluency [RF3B/C] <i>*Decide ahead of time whether students will self-assess or you will assess each student at the end of the fluency lesson (see #9).</i> 8. Remind students that skilled readers are fluent readers. Reading fluently supports comprehending text <u>and</u> helps us read more text in a short amount of time. The three areas we work on include 1) accuracy (reading the words correctly), rate (reading the words at an appropriate rate—not too fast, not too slow), and prosody (reading with appropriate expression). At the end of the unit, students will be reading aloud something they write for the class, so these fluency practices will prepare them to feel comfortable and be successful with that reading. 9. Review the Fluency Checklist and invite students to select one area row (or one row under Accuracy <u>and</u> one under Rate & Prosody) that they would like to improve, based on their past lessons. Explain that either they or you (determined prior to the lesson) will assess their fluency at the end of the lesson. 10. WE DO: Engage students in collaborative oral reading (a.k.a. “popcorn reading”). Repeat 1-2 times as time permits. ● Individual Popcorn Reading is where students have name tags at their desks or tables or their names are even just listed on the board. Each student reads a section (2-3 sentences are fine) at a time and then calls on another peer randomly. Like popcorn kernels randomly popping in a bag, students never know when it will be their turn! Features of popcorn reading include: ○ Everyone is invested and on-task because they do not know when it will be their turn to read. ○ There is typically no chance for prereading jitters commonly seen with reading one after the other. ○ The teacher’s name is regularly called to provide a consistent modeling of fluent reading. (I DO) ○ The teacher can periodically stop the reading and do a very quick comprehension check to ensure students are focused on meaning. 11. Assessment: Students/Teacher use the Fluency Checklist to assess student fluency during the popcorn reading. Offer and invite feedback about the general performance of the group.	High-Intermediate Readers may use this text: Science Variables (GLE 9) NOTE: The Tier 3 vocabulary used in the text raises the GLE of the Fluency articles quite a bit. However, since those terms are also the vocabulary words for this lesson, students will likely have an easier time with both fluency readings.
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(40 minutes) Post this Jamboard in Google Classroom as an “Assignment” and select “Make a Copy for Each Student” so that they each have their own copy	Reading Comprehension: Jamboard Activity [R3C] 12. I DO: ID & Annotate FRAMES 1 and 2. ● Explain that skilled readers use text markings to track complex info. ● For FRAMES 1 and 2, draw attention to the text patterns that help you discern the different variables. Use the Jamboard pen tool to underline and identify: ○ Independent variable (use yellow pen). Tell students to look for what is being changed/investigated such as different types of something...cars, fertilizers, brands, etc. ○ Dependent variable (use green pen). Tell students to look for key words that show data or measurement like weight, volume, length, distance, (i.e.: lbs, mL, grams, miles, feet, cm, bpm, etc.). ○ Controlled variables (use red pen since no orange). Tell students to look for things kept the same or words like: matching, constant, identical, etc. ● Point out the built-in scaffolding to help students identify the independent variable, dependent variable, and controlled variables. (Sticky notes are the same color each time and have hints on them in the beginning.) ● Explain Frame 3 and form small groups. 13. WE DO: Small Groups Work: ID & Annotate FRAMES 4 & 5. ● Ask students to work in groups to use annotation to help identify the different kinds of variables for FRAMES 4 and 5. ● Your students should notice the gradual increase in complexity (stories are longer, less definitional aids available on the sticky notes). 14. YOU DO: Independent Work: <u>Choose FRAME 7, 8, or 9 to ID/Annotate/Print</u> ● Ask students to choose either FRAME 7, 8, or 9 to annotate and identify the variables. They should <u>print out their frame when finished and submit it to the teacher.</u> ● Students should see the responsibility and expectations increase as they work alone and need to turn in their printed work as evidence of their learning. ● Explain the last frame to students: They will be asked to create their own Jamboard Scenario at the end of the unit for a culminating project, so now they know what it will look like.	Just in case there are technology issues, or someone needs accommodations, it would be a good idea to print at least a couple of copies of this Jamboard and get colored sticky notes to model the activity. Scaffolds are built into the Jamboard throughout. Possible accommodations for WE DO and YOU DO: - Students can use their vocabulary quadrants with definitions to help them ID variables. - Frames 7, 8, 9 can be printed so students can write on them or use sticky notes instead of using the computer. Additional practice identifying variables in context: ● Types of Variables (contextualized practice at Wizer.me) ● Go to Quizizz.com and sign up for a free Teacher’s account. Search for “Lesson 5 Experimental Design and Variables” ○ Paper version w/answers
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Wrap-Up/Reflection

- Lead reflection on what students learned and how they might use what they learned in their lives.
- Preview the next lesson.

(10 minutes)

1. **Review:** Review with students the lesson objectives and if/how they were accomplished.
2. **Exit Ticket:** *How can YOU remember the difference between an **independent variable** and a **dependent variable**?*
3. **Next Lesson:** Explain to students that, in the next lesson, we will apply what we learned about variables to explore what's needed to make a **Fair Test**.

Print copies for
hand-written option