

Photon Explores Phonetics and Spelling

Lesson	
Title:	Photon Explores Phonetics and Spelling
Subject/Topic:	Language Arts
Grade Level:	2
Approximate Time:	1-2 hours (varies based on number of sets you want to use)
Prerequisites	Knowledge of how to program Photon to move forward/backward, stop, start again, turn, make noise, and change colors.
Lesson Overview	Use Photon to help your students learn about phonetics and spelling in a new way! Students will program Photon to identify rhyming words, words with silent letters, correctly spelled words, and more!

Essential Question(s):

- How does the ability to read and write affect your daily life?

Anticipated Learning Outcomes

The Learner will:

- Program Photon to visit all of the squares with words that rhyme with a given word
- Program Photon to visit all of the squares that have a word with a given silent letter
- Program Photon to visit all of the squares with compound words
- Program Photon to visit all of the squares with contractions

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- Program Photon to visit the given set of words in alphabetical order
- Program Photon to visit all of the correctly spelled words
- Read out loud all of the identified words in a set

Standards

<p><u>CCSS Standards</u></p>	<p>CCSS.ELA-LITERACY.RF.2.3 Know and apply grade-level phonics and word analysis skills in decoding words. CCSS.ELA-LITERACY.RF.2.3.F Recognize and read grade-appropriate irregularly spelled words.</p>
<p><u>NGSS Standards</u></p>	
<p><u>ISTE Student Standards</u></p>	<p>7c Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.</p>
<p><u>ISTE Educator Standards</u></p>	<p>6d Model and nurture creativity and creative expression to communicate ideas, knowledge or connections. 7a Provide alternative ways for students to demonstrate competency and reflect on their learning using technology.</p>
<p><u>TEKS Standards</u></p>	<p>§110.4.b.2.Ai demonstrate phonological awareness by: (i) producing a series of rhyming words</p> <p>§110.4.b.2.Bii and iv demonstrate and apply phonetic knowledge by: (ii) decoding words with silent letters such as knife and gnat; (iv) decoding compound words, contractions, and common abbreviations</p>

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§110.4.b.2.D

alphabetize a series of words and use a dictionary or glossary to find words

§126.6.b.1.C and D

Creativity and innovation. The student uses creative thinking and innovative processes to construct knowledge and develop digital products.

The student is expected to:

(C) explore virtual environments, simulations, models, and programming languages to enhance learning;

(D) create and execute steps to accomplish a task

Planning

Materials (including technology)

- 1 Photon per group
- 1 Education Mat per group **or**
 - masking tape
 - scissors
 - ruler
- Printer and paper
- Pencils for students
- Colored pencils for students

Teacher Set Up

- If you do not have an education mat for each group, see the directions on how to make a grid, found in resources (each team will need their own grid). Make it as many rows and columns as you want; each space will have its own word in it.
- Decide what types of words you will be having your students identify (see the resources at the end for suggestions).
- Choose whether you want each team to be working on the same set of words, or different sets of words. If you have them working on different sets of words, you can just have each group rotate to a new grid

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and program Photon each time they get to a new grid.

- Print out the sets of word cards from resources (or make your own), cut them apart.
- Tape one word to each square of your grid on the floor. It is ok if you have blank spaces or do not use all of the words.
- Divide your class into teams based on how many Photons you have.
- Make sure the distance Photon moves in one step is the same size as your grid space (i.e. if you spaced your grid lines 30cm apart, Photon's steps need to be 30cm each).



- Open the “Blank Grid Template” and make sure the rows and columns equal however many you have on your grid or Education Mat. Print one per student (at least).

Procedures

Activity	Instructor's Notes	Scaffolding/ Pacing
1. Anticipatory Set	Knowledge to help make connections?	
	<ul style="list-style-type: none"> • On your board, write a list of one of the word sets. (To make it easier, draw the grid on your board and fill it in with the words). • Have you students write one word per rectangle on the blank grid template (all in the same order as the board). • Tell that they will need to identify all of the words that are correct (explain what set you chose, i.e. all of the words that rhyme with CAT.) • Have them color in each rectangle that has a correct word in it. 	

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	<ul style="list-style-type: none"> • Then have them draw a line that connects each rectangle they colored in. They can go over words that are incorrect, but they must visit all of the correct words. • Have them compare with a partner; did they find all of the same correct words? <i>Hopefully yes!</i> • Did they have the same order to visit them in? <i>Maybe not, and that is ok!</i> • Now, they will do the same task, but using Photon! 	
2. Lesson	Describe the lesson procedures step-by-step.	
	<ol style="list-style-type: none"> 1. Explain to your students that they will use Photon to help show you that they can read, spell, and pronounce words! 2. Tell them that you have put out a “word set.” Some of the words in the set are correct, and some are not correct. 3. They will program Photon to visit all of the correct words in the set. Photon may drive over incorrect words, but it cannot stop there. 4. They will program Photon to stop on each CORRECT word and either change color or make a noise. 5. They will then read the correct word out loud. 6. They will then indicate that Photon can move again (i.e. a tap on the head). 7. Photon will then visit the next correct word, and the same thing will happen. 8. This will occur until all of the correct words have been visited. 9. Introduce the first word set and what the instruction is (i.e. program Photon to visit and stop on all of the words that rhyme with car). 10. Visit each group when they are done, and watch their program to make sure Photon is only visiting the correct words, and that they are reading the words out loud correctly. 11. Change the words and have them do it again! 	<p>If your students are struggling, have them use a paper grid first. They can fill it out, or you can have them ready just in case!</p>
3. Assessment	How will you assess your students’ mastery of the learning objectives?	

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	See rubric below	
4. Wrap up/Closure	How will you tie this lesson together at the end beyond assessment? What reflections should your students complete?	
	<ul style="list-style-type: none"> • What words sets were the most challenging to identify? Why? • Why is spelling important for communication? • Why is reading important for communication? 	
5. Extension	How could this lesson be extended?	
	Pick one of the above sets of instructions (words that rhyme, words with a silent letter, etc).. Have each team come up with enough words to fill their grid, where at least 5 are 'correct'. Have them put their words on their grid, then have each team rotate to another team's grid. Each team needs to program Photon to visit this new set of words.	

Resources:

- [Click here](#) to access directions on how to construct the grid.
- [Click here](#) to access words to print out for RHYMING
- [Click here](#) to access words to print out for ALPHABETICAL ORDER
- [Click here](#) to access words to print out for CONTRACTIONS
- [Click here](#) to access words to print for COMPOUND WORDS

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- [Click here](#) to access words to print out for SILENT LETTERS
- [Click here](#) to access words to print out for COMMON SPELLING MISTAKES

RUBRIC (edit to adjust to the number of word sets you are using)

	3	2	1
Word Set 1	The students correctly identified three quarters to all of the words in set 1.	The students correctly identified half to three quarters of the words in set 1.	The students did not correctly identify more than half of the words in set 1.
Word Set 2	The students correctly identified three quarters to all of the words in set 2.	The students correctly identified half to three quarters of the words in set 2.	The students did not correctly identify more than half of the words in set 2.
Reading Out Loud Set 1	--	The students correctly read the words out loud as Photon stopped on them.	The students did not correctly read the words out loud as Photon stopped on them.
Reading Out Loud Set 2	--	The students correctly read the words out loud as Photon stopped on them.	The students did not correctly read the words out loud as Photon stopped on them.

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<p>Programming of Photon Set 1</p>	<p>The students programmed Photon accurately at least 90% of the time. I.e. it turned left when they wanted it to, it stopped and made noise or changed colors when they wanted it to, etc.</p>	<p>The students programmed Photon accurately some of the time but had to use another method to help them identify the correct words in the set.</p>	<p>Students were not able to program Photon accurately. They identified the correct words in the set using another method.</p>
<p>Programming of Photon Set 2</p>	<p>The students programmed Photon accurately at least 90% of the time. I.e. it turned left when they wanted it to, it stopped and made noise or changed colors when they wanted it to, etc.</p>	<p>The students programmed Photon accurately some of them time but had to use another method to help them identify the correct words in the set.</p>	<p>Students were not able to program Photon accurately. They identified the correct words in the set using another method.</p>
<p>Teamwork</p>	<p>The team worked great together. Students took turns and figured things out on their own.</p>	<p>The team worked fairly well together. Students needed some guidance on how to take turns and let everyone participate.</p>	<p>The team did not work well together. Students did not take turns or let others contribute.</p>