



E.T. Phone Home: Fact or Fiction

Subject: Earth and Space Science

Grade Levels: 6 (5-8)

Lesson Length: 15 minutes

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In the timeless movie, “E.T. the Extra-Terrestrial,” released in 1982 by Universal Studios, E.T., an alien lifeform, is stranded on Planet Earth and quickly becomes friends with Elliott, the little boy who finds him. After becoming gravely ill, Elliott realizes that E.T. needs to return home in order to save his life. However, in order to arrange for his transport, E.T. must ‘phone home.’ Students embark on a scavenger hunt in order to discover the answer to the question, ‘E.T. Phone Home: Fact or Fiction.’ Just in case you’re curious, E.T. DID in fact phone home . . . by bouncing a signal from satellite to satellite until he reached his home planet, powered through the miracle of photovoltaics. For this lesson, students should have a basic understanding that different forms of energy can be converted into electricity, which is then used to provide power to the world around us.

Objectives

After this activity, students should be able to:

- ➔ *Explain that the sun is used as a source of energy for power here on Planet Earth.*
- ➔ *Explain that the sun is used as a source of energy for power in space.*

Engineering Connection

Since Russia launched Sputnik 1 into space in 1957 (the first satellite in orbit), scientists and engineers have continued to develop innovative, new technological capabilities to support exploration into the vastness beyond our planet, deeper and deeper into space. Fast-forward to the year 2016, and there are now over 1,100 active satellites in orbit, in addition to the 2,600 satellites still in orbit that are no longer operational.

You might be asking what do satellites have to do with photovoltaics. The answer to that question is quite simple: satellites are powered by transforming the energy of the sun into electricity, a useable form of energy. This happens through solar arrays that are present on virtually every satellite in orbit. The innovations that have been developed by engineers in order to power the thousands of satellites in orbit today just might prove to be the very innovations that help us solve our energy crisis here at home on Planet Earth.

Materials

- Each group needs:
 - Clue Numero Uno
 - E.T. Phone Home - Fact
 - QESST World Puzzle
 - QR Code Periodic Table of the Elements
 - QR Code What is a Satellite
 - Solar Energy AWESOMENESS Crossword Puzzle
 - Tackle Box (<http://amzn.to/2AFWz8b>)
 - Alphabet Multilock (<http://amzn.to/2EneCIE>)
 - Directional Multilock (<http://amzn.to/2ElwxZW>)
 - 3-Digit Number Lock (2) (<http://amzn.to/2CQbsdM>)
 - UV Flashlight (<http://amzn.to/2EmsZM>)
 - Device with QR Reader
- To share with the entire class:
 - One copy per student of Small Group Participation Rubric Criteria and Scoring Invisible Pen (<http://amzn.to/2AGflft>)
 - One solar-powered, dancing, flower pot for each member of the winning team
 - One package of Reese's Pieces candy for each student

Setup

- Make one copy of all of the materials for each group (Clue Numero Uno, E.T. Phone Home – Fact, QESST Wordle Puzzle, QR Code - Periodic Table of the Elements, QR Code – What is a Satellite, Solar Energy AWESOMENESS Crossword Puzzle)
- Cut the QESST Wordle Puzzle into several pieces, and write 911 in invisible ink

pen on different pieces of the QESST Wordle Puzzle. (Make sure to write one number on three, different pieces of the QESST Wordle Puzzle.)

- Lock the UV Flashlight and the pieces of the QESST Wordle Puzzle inside the 3-digit lock box. Set the lock to 014.
- Set the following locks to the correct combinations:
 - Set the alphabet multilock to STAR.
 - Set the directional multilock to LEFT ARROW, LEFT ARROW, DOWN ARROW, DOWN ARROW, DOWN ARROW.
 - Set the three-digit lock to 911.
- Place the attachment, E.T Phone Home – Fact, inside the toolbox.
- Place the dancing sun flowers and Reese’s Pieces candy inside the toolbox. (optional)
- Use all three locks to secure the toolbox.
- On each copy of the Solar Energy AWESOMENESS Crossword Puzzle circle the follow items in red marker: Circle 3 across, circle 6 across, circle 1 down, circle 2 down, and circle 4 down.
- Set a virtual timer for 30 minutes. (<http://bit.ly/1foGrGh>)
- Teachers should be actively involved with students throughout the course of this interactive activity, intervening when necessary in order to curb frustrations, as well as help students stay focused and on-task. In order to uncover the combinations to the different locks, students must correctly solve each clue. Two opportunities are inserted to give “hints” to groups that are struggling to come up with the correct solutions.

Introduction

As class begins, read the following scenario to students:

E.T. is an alien lifeform who has been stranded here on our planet. He is discovered by a little boy named Elliott, and the two quickly become friends. However, E.T. knows that in order to survive he must find a way to return home.

The following video clip shows the moment E.T. is finally able to communicate his need to “phone home.”).

<https://www.youtube.com/watch?v=6xZif3WmG7I>

After E.T. becomes gravely ill, Elliott realizes that E.T. must return home in order to save his life. Remember, in order to arrange for his transport, E.T. must “phone home.”

<https://www.youtube.com/watch?v=UUWYfNNEbyk>

Is it too late to save E.T.’s life?

Today, you will discover the answer to the question: “E.T. Phone Home: Fact

or Fiction?” by embarking on a scavenger hunt, the answer to each clue leading your group along the way. Here is your first clue. (Hand each group the first clue, “Clue Numero Uno” and start the 30-minute timer).

Remember, the clock is ticking, and E.T.’s life hangs precariously in the balance.

With the Students

- 1) Review group norms:
 - a. You have 30 minutes to find the answer to the question, “E.T. Phone Home: Fact or Fiction?”
 - b. You must work together as a team. The better you communicate with your teammates, the higher your chances for success. Each time you discover the answer to a clue, make sure you communicate it to the rest of your teammates.
 - c. There will be one winning team, and that team will be the first to correctly uncover the answer to the final clue which will lead them to the final hiding place where the answer, and prize, awaits them.
 - d. Explain to students any places in the room that are off limits, such as the teacher’s desk, book shelves, etc.
- 2) Hand each group a copy of “Clue Numero Uno”, Start the 30-minute timer.
- 3) “The answer to your first clue is hidden within the first minute of “Bill Nye – The Sun!” “The sun is the closest ____ to Planet Earth.” (Answer: STAR).
 - e. Watch the first minute of “Bill Nye - The Sun!” as a whole group. <https://vimeo.com/107050146>
- 4) “Complete the Solar Energy AWESOMENESS Crossword Puzzle to uncover your SECOND CLUE!!!”
 - f. As each group finishes solving the first puzzle, hand them a copy of the Solar Energy AWESOMENESS Crossword Puzzle. Remind students that we read from LEFT TO RIGHT!!! (Answer: LEFT ARROW, LEFT ARROW, DOWN ARROW, DOWN ARROW, DOWN ARROW)
- 5) “Read THIS awesome article in order to solve your next clue . . . what is the power source for a satellite? Remember, there are no electrical cords or outlets in space! Figure out what that power source is MADE OF, and you’ll have your THIRD CLUE!!!” (Silicon: Atomic Number 14, Answer: 014)
 - g. Once scanned, the QR code will take students to an article by NASA called, “What is a satellite?” If you do not have access to a QR reader, please provide students with the following link: <https://go.nasa.gov/2eO1Weo>
 - h. HINT #1: Periodic Table of the Elements Attachment
- 6) Your FINAL clue to unlock the ANSWER IS . . . HIDDEN INSIDE THAT LOCK-BOX!!! (Answer: 911)
 - i. HINT #2: Who do YOU call when you need help???

The first team to the final location will discover the following items:

- E.T. Phone Home - FACT
- Dancing flower pots, powered by the sun. There should be one dancing flower pot for each student on the winning team. Link: <http://amzn.to/2odqvqg>. The flower pots are significant for two reasons:

First, the flower pots use solar energy to dance, which is the same technology that allowed E.T. to phone home.

Second, the flowers in the pot indicated the health of E.T. throughout the movie. (This may need to be explained explicitly to students.)

- Individually packaged baggies of Reese's Pieces candy. There should be enough for each student to have a packet as they enjoy the final video clips, not just enough for each student on the winning team.)
 - ➔ *It is imperative that the teacher is aware of any student in their classroom with peanut sensitivities/allergies so that an alternative candy can be used in its place. This information should be indicated on the student health forms, which are completed by parents/guardians during school registration. These forms are usually located in the health office, as well as in each student's cumulative folder.*
- Many students will not have seen E.T. in its entirety. In order for students to understand the significance of Reese's Pieces, play the following video clip showing Elliot luring E.T. with Reese's Pieces candy. Give each student a bag of Reese's Pieces so they can enjoy their candy while they are watching the remaining three video clips.
 - Reese's Pieces: <https://www.youtube.com/watch?v=WQoRHNSarsc>
 - E.T. is still alive: <https://www.youtube.com/watch?v=a-9990dlfvo>
 - Ride in the Sky: <https://www.youtube.com/watch?v=oR1-UFrcZ0k>
 - "I'll be right here," (final scene): <http://bit.ly/1klzBaM>

Assessment

Activity Embedded Assessment

As the teacher circulates throughout the room, the teacher makes observations regarding each group participant's ability to work as a member of a team. Using a small group participating rubric is suggested to allow ranking their performance on a scale (for example, 1-4). This ranking will be discussed with students individually at the close of the activity in order to have a productive dialogue regarding areas for celebration and areas for improvement, heading into the next group activity.

Post-Activity Assessment

Students will have five minutes at the end of class to explain how the use of solar energy allowed E.T. to 'phone home' using an exit-ticket format.

References

<https://go.nasa.gov/2qFU3iu>

<https://science.nasa.gov/science-news/science-at-nasa/2002/solarcells>

<http://www.space-airbusds.com/en/news2/production-od-solar-arrays.html>

<http://talkingpointsmemo.com/idealab/satellites-earth-orbit>

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