

Learning Geography Through “Mystery Skype”

STEM: Science, Technology, Engineering, Mathematics



STEM Classroom Series

The STEM Classroom Series features lessons that promote understanding of STEM content knowledge, integrate STEM with non-STEM subjects, and increase students' exposure to STEM-related career options.

About this Segment

STEM education provides students with the opportunity to connect with local and global communities using technology. Students in Ms. Robin Farnsworth's 3rd grade class at Neil Armstrong Academy in West Valley City, Utah, videoconference with students in a classroom from another state and work collaboratively to determine in which state the other school is located.

Application activities (complete all that meet your goals for viewing this segment)

A. Learn more about STEM education

1. In the table on the next page, identify the elements of effective instruction, as well as the elements of effective STEM instruction, that you observed in this lesson.
2. How could the teachers enhance or add to the elements of instruction in their lesson?
3. How could the teachers enhance or add to the elements of STEM instruction?

C. Infuse STEM principles into your own lessons

1. Apply the six questions in the “Replicate this lesson” activity to one of your own lessons.
2. Determine challenges you might face in applying these STEM concepts to your own lesson. How can you overcome these challenges?

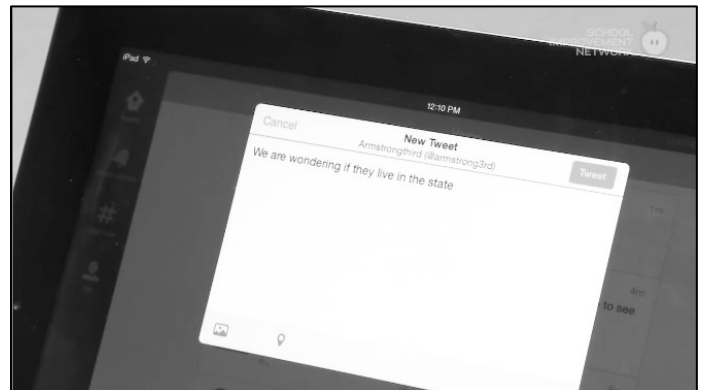
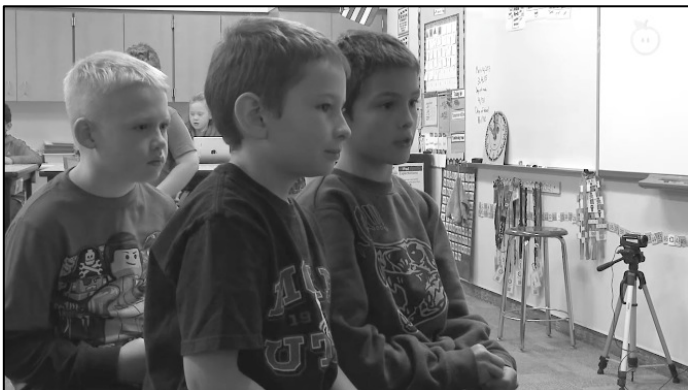
B. Replicate this lesson

1. *What are the learning objectives you want your students to achieve?*
How would you modify the lesson's objectives, outlined in the Lesson Plan below, for your own students and curriculum? What other objectives, if any, will you set?
2. *What content knowledge do you need to acquire or expand?*
This activity teaches students about geography and the use of technology. Which of these concepts do you need to learn more about? Visit the Resources to Support Content Knowledge links in the lesson plan section of this guidebook.
3. *How will you create the time and space to engage students in this lesson?*
How much time will this learning activity take to plan and carry out? How can you integrate the activity into your current curriculum map?
4. *What materials and other resources do you need for this lesson?*
What materials are needed for this lesson? See the Materials section of the lesson plan. What collaboration is necessary with administrators and other teachers?
5. *How will you assess student learning?*
Ms. Farnsworth monitors the class through observation. How else might you assess student learning?
6. *How can you promote a STEM focus in your instruction?*
What STEM experiences were students engaged in during this lesson (see the “Elements of Effective STEM Instruction” below)? What are some others that you could include?

Guidebook – Learning Geography Through “Mystery Skype” (cont.)

Elements of Effective Instruction	Elements of Effective STEM Instruction
<ul style="list-style-type: none"> - High expectations for all students - Rigorous content - Authentic performance tasks - Real-time assessment adapted to student needs - Student-driven learning - Strong relationships among students and between teacher and students - Equitable, culturally relevant content and practices - Evidence of 21st century skills, e.g. critical thinking, problem solving, collaboration, creativity, communication - Technology that enhances learning - Cross-curricular (interdisciplinary) integration 	<p><i>In addition to the Elements of Effective Instruction left, effective STEM instruction can include:</i></p> <ul style="list-style-type: none"> - Teachers who develop solid STEM-related content knowledge - Hands-on problem-solving activities that have real-world relevance - Integration of STEM into non-STEM subjects, especially art and design - Use of industry-standard software, tools, and procedures such as the engineering design cycle - Increased awareness of STEM fields and occupations, especially among underrepresented populations - Enthusiasm about further STEM-related learning - Connections between in-school and out-of-school learning opportunities - Industry and higher-ed partnerships that encourage hands-on student exploration of STEM-related careers
<p>Sources: California Dept. of Education. (2015). Science, technology, engineering, & mathematics. Retrieved February 21st, 2015, from http://www.cde.ca.gov/pd/ca/sc/stemintrod.asp President’s Council of Advisors on Science and Technology (PCAST). (2010). Prepare and inspire: K-12 education in science, technology, engineering, and math (STEM) for America’s future. Retrieved from the Whitehouse.gov website: http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-stemed-report.pdf</p>	

General STEM Information and Resources
<p>Utah STEM Action Center (n.d.). STEM Utah. Retrieved January 22, 2015, from http://stem.utah.gov/</p>
<p>California Department of Education (n.d.). Science, technology, engineering, and mathematics. Retrieved January 22, 2015, from http://www.cde.ca.gov/pd/ca/sc/stemintrod.asp</p>
<p>National Education Association. (n.d.). The 10 best STEM resources: Science, technology, engineering & mathematics resources for preK-12. Retrieved March 23, 2015, from http://www.pbs.org/teachers/stem/</p>
<p>National Research Council. (2011). Successful K-12 STEM Education: Identifying Effective Approaches in Science, Technology, Engineering, and Mathematics. Retrieved March 23, 2015, from http://www.stemreports.com/wp-content/uploads/2011/06/NRC_STEM_2.pdf</p>
<p>PBS Teachers. (n.d.). STEM education resource center. Retrieved March 23, 2015, from http://www.pbs.org/teachers/stem/</p>
<p>STEM Education Coalition (n.d.). Home page. Retrieved January 22, 2015, from http://www.stemedcoalition.org/</p>

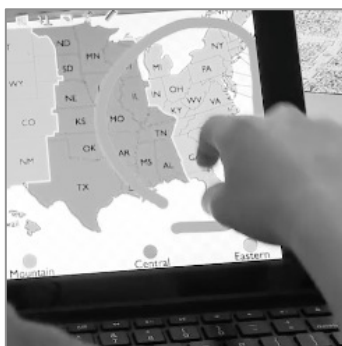


Teacher: Robin Farnsworth

Grade/Content Area: 3rd Geography

School: Neil Armstrong Academy, West Valley City, Utah

Lesson Duration: 30 min.



Lesson Objective(s)

Students will participate in a “Mystery Skype,” each fulfilling a role that requires one or more of several knowledge bases and skills: US geography, collaboration in formulating effective yes-no questions, face-to-face communication with classmates, and digital communication through kid-friendly social media apps.

Key Concepts and Vocabulary

(See below for online resources that support content knowledge)

- Time zones
- The names of states in the United States of America
- The four cardinal directions

Standards Addressed in the Lesson

- Use technology in collaborative writing activities for audiences outside of the classroom
- Use online resources in problem-solving activities

Assessment

Teacher will circulate and ask questions to assess learning.

Prior Knowledge and Skills

Knowledge: Students should know major US landmarks (Mississippi River, Rocky Mountains, etc.) and the four cardinal directions.

Skills: Students should know how to ask and answer questions to deduce the state a school is in, how to use tablets, and the ability to navigate a map of the US.

Materials

- Laminated maps & dry-erase markers
- iPads with Internet connection
- iPad apps for documentation (Twitter, Kidblog, Edmodo, etc.)
- A computer or laptop with Internet connection and webcam
- Videoconferencing software (Skype, Facetime, etc.)



Lesson Plan – Learning Geography Through “Mystery Skype” – (cont.)



Differentiating the Instruction

Most tasks are individualized for each student, with the ability for students to set their own pace. Teacher will provide support for those who need it.

Lesson Procedures

1. Teacher will contact the other school, using videoconferencing software. Students will randomly determine (e.g., rock-paper-scissors) to see who asks the first question.
2. The “think tank” group determines “yes” or “no” questions to ask the other school, and the “runner” relays that question to the “face” who asks that question. The “expert” group learns details about specific states to better prepare for future calls. All students respond to the other school’s questions by raising green or red cards.
3. Students not directly involved with those groups will document the experience through the use of iPads and apps such as Twitter and KidBlog.
4. Once each class thinks they know the state of the other class, both reveal their predictions.

Resources to Support Content Knowledge

Microsoft. (n.d.). Skype in the classroom. Retrieved April 27th, 2015, from <https://education.skype.com/>

Burris, T. (n.d.). U.S. geography: The west. Retrieved April 27, 2015, from the Discovery Education website: <http://www.discoveryeducation.com/teachers/free-lesson-plans/us-geography-the-west.cfm>

Sheppard Software (n.d.) U.S.A games. Retrieved April 27, 2015, from http://www.sheppardsoftware.com/web_games.htm

Related Video Lessons and Resources

3rd grade: Solving a playground problem. Edivate. <https://pd360.com/#resources/videos/6110>

2nd-3rd grade STEM: Investigating first-class levers. Edivate. <https://pd360.com/#resources/videos/8693>