Helper Ants

Author: Brandie Luna
Grade Level: K
Duration: 1-2 class periods

**National Standards**

**GEOGRAPHY**

**ELEMENT ONE: THE WORLD IN SPATIAL TERMS**

3. How to analyze the spatial organization of people, places, and environments on Earth’s surface.

**ELEMENT FOUR: HUMAN SYSTEMS:**

13. How the forces of cooperation and conflict among people influence the division and control of Earth’s surface.

**NEXT GENERATION OF SCIENCE STANDARDS**

From Molecules to Organisms: Structures and Processes

K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.

**ELA COMMON CORE**

**Reading**

Informational Text

Range of Reading and Level of Text Complexity

K.RI.10 Actively engage in group reading activities with purpose and understanding.

AZ.K.RI.10 Actively engage in group reading of informational and functional texts, including history/social studies, science, and technical texts, with purpose and understanding.

**Writing**

Speaking and Listening

Comprehension and Collaboration

K.SL.2 Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.

K.SL.5 Add drawings or other visual displays to descriptions as desired to provide additional detail.

**Language**

Conventions of Standard English

K.L.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

e. Use the most frequently occurring prepositions (e.g., to, from, in, out, on, off, for, of, by, with).

**Common Core Standards**

**SIOP Elements**

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**Other Arizona Standards**

**SOCIAL STUDIES STANDARDS**

Strand 4: Geography

Concept 1: The World in Spatial Terms

PO 3. Determine the relative location of objects using the terms near/far, behind/in front, over/under, left/right, up/down.

Concept 3: Physical Processes

Science Strand 4

Concept 3 Identify plants and animals in the local environment.

**SCIENCE STANDARD**

Strand 5: Physical Science

Concept 2: Position and Motion of Objects

PO 1. Describe spatial relationships (i.e., above, below, next to, left, right, middle, center) of objects.
Helper Ants

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TESOL Standard(s)

Goal 2, Standard 2
To use English to achieve academically in all content areas: Students will use English to obtain, process, construct, and provide subject matter information in spoken and written form

- comparing and contrasting information
- persuading, arguing, negotiating, evaluating, and justifying
- listening to, speaking, reading, and writing about subject matter information
- gathering information orally and in writing
- retelling information
- selecting, connecting, and explaining information
- analyzing, synthesizing, and inferring from information
- responding to the work of peers and others
- representing information visually and interpreting information presented visually
- hypothesizing and predicting
- formulating and asking questions
- understanding and producing technical vocabulary and text features according to content area
- demonstrating knowledge through application in a variety of contexts

Arizona English Language Proficiency Standards

Stage I Writing Applications
Standard 1: The student will express his or her thinking and ideas in a variety of writing genres. The student will express his or her thinking and ideas by using a variety of writing genres, as demonstrated by:
B3: participating in shared writing to provide directions or information related to real world tasks.

Stage I Language
Standard 1: The student will identify and apply conventions of standard English in his or her communications. The student will demonstrate knowledge of parts of speech by:
B-2: naming prepositions of direction (e.g., up, down, over) from a given prompt.

Overview

Cooperation is essential in society. Ants are a great example when they work together so they can survive the winter. From looking at ants, students can learn much about this valuable trait.

Purpose

In this lesson students will learn how to work together as a team and build a bridge for the ants to cross. They will also be practicing prepositions that denote location. This lesson includes strategies for diverse learners (ELLs).

Key Vocabulary

Cooperation: working together
Bridge: something that connects one place to another

Materials

- Marshmallows
- Toothpicks
- Scoring Guide for Bridge Building
Objectives

The student will be able to:

1. Design a bridge that will allow an ant to cross.
2. Cooperate with their team in order to build the bridge.
3. Determine relative location of an object.

Procedures

Prerequisite Knowledge:
In this lesson students should have prior knowledge of the plants and animals of the Sonoran Desert. A good lesson for building this background is the kindergarten lesson called The Sonoran Desert found at http://geoalliance.asu.edu/azga/

Prior to Lesson: Teacher needs to read article about ants in the Sonoran Desert found at http://www.desertmuseum.org/books/nhsd_ants.php

Session One

Engage:

a. Begin the lesson by showing a map of the Sonoran Desert. Have students discuss their prior knowledge about animals and plants in the Sonoran Desert. Then ask how various desert animals get food during different times of the year. (Preparation: Linking to Past Learning) Share several of the different kinds of ants found in the Sonoran Desert and how ants get their food (eating seeds, fungus, meat, nectar of plants, the “juice” of other insects) from the Arizona-Sonora Desert Museum article.
b. Read aloud the book, Two Bad Ants by Chris Van Allsburg. (Integrating Processes: Listening)

Explore:

c. Talk to the students about cooperation (how friends should work together) instead of hurting feelings. Give them several examples of how to help one another in different situations. Have them share their ideas on how to cooperate. (Scaffolding: Modeling) (Application: Linked to Objectives)

d. Show students pictures of ants in their environment and how important it is for each ant to do his or her job. http://www.slideshare.net/bright9977/ants-lessons (Integrating Processes: Listening) (Scaffolding: Comprehensible input)

Elaborate:

e. Have students make a list of jobs that ants might do to survive. Bring back the idea of cooperation and how ants need teamwork to complete their tasks and that they (the students) are going to use teamwork to build a bridge for the ants. (Application: Linked to Objectives) (Scaffolding: Comprehensible input)
f. Divide the class into small groups and show them the video of ants building a bridge. http://www.youtube.com/watch?v=n71abhaadRs (Grouping Option: Small groups) (Scaffolding: Modeling)

Explain:

g. Show students the supplies available to build a bridge. Have the groups brainstorm what they will need from the available supplies. Then have them draw their plan on a piece of paper. (Scoring Guide: drawing of bridge) After you have approved their drawing, distribute the supplies needed to the small groups. (Application: Hands on and Promotes engagement)
h. Explain to them that they cannot make any changes to their plan. They need to follow their drawing. (Application: Hands On, Meaningful, Engaging)
i. Allow time to work. (Scoring Guide: building of bridge) As small groups finish, they should tell you what went wrong (Scoring Guide: pitfalls) and what worked well (Scoring Guide: positives). Ask each group member how he/she cooperated to make the bridge. (Scoring Guide: cooperation) At this time they can fix what they want and make their bridge better. (Scoring Guide: rebuild) (Assessment: Oral, Group) Ask each group what was the purpose of the bridge (so ants can carry food). (Scoring Guide: purpose of the bridge)

Evaluate:

j. Have all groups stop working. One at a time take the groups’ bridges and have them span two objects (books, desks, etc) and place the plastic bug on the bridge. If bridge holds up, students can go on to explain orally to everyone why their bridge worked so well. If bridge did not support the plastic bug, have the group state what they would do differently next time. (Application: Hands On, Meaningful, Engaging)
Session Two
a. Review from yesterday what is cooperation and what is the function of a bridge. Then have students get into the same groups as yesterday and retrieve their bridge from the storage area. (Preparation: Linking to Past Learning)

b. Explain that today they will be using words to show location. Demonstrate using one of their bridges, how the ant can be near/far, behind/in front, over/under, left/right, up/down, above/below, and next to. (Scaffolding: Modeling)

c. Have students work in groups and move the bug as you call out the relationship words. Practice for several minutes. (Application: Hands on and Promotes engagement)

d. Move around the room documenting on the Relationship Word Observation Checklist who is able to show the bug in the correct relationship. (Assessment: Individual)

e. Distribute the Writing Assignment. Explain that the students will be drawing a bug using relationship words that they have been practicing. Write the relationship words on the whiteboard. Tell the students to pick one of the words and then draw a bug in that position in relationship to the bridge. After they have drawn the bug, they need to write a sentence on the lines provided that describes where the bug is located. Model several sentences for them on the whiteboard. (Scaffolding: Modeling) Then erase the models. (Assessment: Individual) (Integrating Processes: Writing)

f. Have students match the picture of the vocabulary word to its definition and name when given orally. (Assessment)

Assessment

Student groups will score 80% or higher on the Scoring Guide for Bridge Building.

Extensions

Have students make a bar graph answering the question which ant will win the race, the black ant or the red ant?
http://www.youtube.com/watch?v=XiJc5pFCboE

Sources

Ants building a bridge
http://www.youtube.com/watch?v=n71abhaadRs

The Sonoran Desert Ant
http://www.desertmuseum.org/books/nhsd_ants.php


Ants and their work
http://www.slideshare.net/bright9977/ants-lessons

Two Bad Ants by Chris Van Allsburg

The engineering design process
http://www.engr.ncsu.edu/theengineeringplace/media/graphics/design-process.png