It’s An Invasive World

Contributors

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Intended Audience

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<td>K-4</td>
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<td>5-8</td>
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<tr>
<td>9-12</td>
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Activity Characteristics

<table>
<thead>
<tr>
<th>Classroom Setting</th>
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<tr>
<td>Requires special equipment</td>
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<tr>
<td>Uses hands-on manipulatives</td>
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<tr>
<td>Requires mathematical skills</td>
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<tr>
<td>Can be performed individually</td>
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<tr>
<td>Requires group work</td>
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<tr>
<td>Requires more than one (45 min class) period</td>
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<tr>
<td>Appropriate for special needs student</td>
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Introduction

Description

This activity is a board game that introduces students to the problems associated with invasive species and the potential methods invasive species are spread around the world.

Abstract

In this activity students will learn the definition of invasive and introduced species and the potential negative effects associated with invasive species. Students will play a game that has them acting as invasive species that are attempting to establish new populations around the world. Through this game students will gain knowledge on methods that invasive species use to travel to new areas and methods of prevention, control and eradication of invasives. Additionally, they will learn to distinguish introduced and invasive species and become familiar with several common invasives in North America.

Core Themes Addressed

<table>
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<tr>
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<tbody>
<tr>
<td>Microbial Cell Biology</td>
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<tr>
<td>Microbial Genetics</td>
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<td>Microorganisms and Humans</td>
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<td>Microorganisms and the Environment</td>
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<td>Microbial Evolution and Diversity</td>
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<td>Environmental Science</td>
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Keywords

Aquatic environment, invasive species, anthropogenic effects, introduced species

Learning Objectives

At completion of this activity, learner will

1. Compare and contrast invasive species and introduced species
2. Recall the most common method for aquatic invasions
3. Recognize problems caused by invasive species.
National Science Education Standards Addressed

Standard A: Science as Inquiry

- Abilities necessary to do scientific inquiry

Standard B: Life Science

- Interdependence of organisms

Standard F: Science in Personal and Social Perspectives

- Personal and community health
- Environmental quality
- Natural and human-induced hazards
It’s An Invasive World

Student Prior Knowledge

No prior knowledge is required, however, it may benefit students to familiarize themselves with basic geography to enable them to use and understand the world map.

Teacher Background Information

Teacher should familiarize themselves with the definitions for invasive and introduced species. It may be beneficial to research local invasive species to help the students engage through familiarization.

Class Time

This activity will require a minimum of one 50 minute class period

1. Introductory Powerpoint Presentation (10 minutes)
2. Play game (35 minutes)
3. Clean up (2 minutes)
4. Wrap up discussion (3 minutes)

Teacher Preparation Time

This lesson will require approximately 30-50 minutes of preparation time depending on types of game boards used.

1. Print worksheets (5 minutes)
2. Prepare for lesson (review powerpoint and topics) (5 minutes)
3. Print game boards: either poster sized and glue to foam board or laminate or print on 11x17 inch paper (10-20 minutes)
4. Print and cut game cards and game rules (10-15 minutes)
5. Prepare game pieces (5 minutes)

Safety Precautions

None.
Materials and Equipment (2-4 persons per group)

1. Game board (poster sized or 11x17in paper)
2. Bag of game pieces (15 per color, 4 colors per group- 1 game piece of each color should be marked with black “X”)
3. Set of each type of game cards: Playing cards, Territory Cards and Invasive Species Cards
4. Copy of game rules

Methods

1. Place cards upside down in 3 separate piles by color.
2. Each player draws one invasive species card. Others may see this card and you may not select another. You are stuck with the one you have!
3. Each player chooses a different cube color. These cubes will signify your invasion locations when placed on the board.
4. Find your cube with the “X” place this on your territory of origin. This cube may never be removed.
5. The oldest player will start the game.
6. Starting player chooses one playing card and follows the directions on the card. Make sure to read the card directions carefully. **CARDS MUST BE READ ALOUD.** If a player is caught not reading the cards aloud during their turn they must remove 1 cube from the board.
7. Once their turn is complete the next player will draw a playing card and follow the directions.
8. Continue to choose playing cards and follow directions.
9. Playing cards and territory cards can be reshuffled and reused if necessary.
10. The game ends when one player has invaded the entire world and has the maximum cubes on every territory or if time is limited, the player that wins will be the one with the most cubes on the board when time is up.
Notes on Game Board:

- The circled numbers on the territories indicate the **MAXIMUM** number of cubes that can be on that territory at any one time. If the maximum is reached you may not add another cube unless one is removed.
- Playing cards may be directed at a certain type of species (Example: “Plant species…”), even if the player reading the card is not a plant species this card will pertain to any plant species within the group and they must follow the directions…for good or bad!

Tips/Suggestions

1. It may be helpful to the group if the instructor reads the first few instructions outloud and has the class complete them together. This will help groups get started more efficiently.
2. Students may need help identifying their country of origin so the instructor may wish to walk around and encourage students to locate the correct spot on the map.

References

Extension/Additional Resources

National Invasive Species Information Center website:

http://www.invasivespeciesinfo.gov/index.shtml

Answers to Student Handouts

1. An ___**introduced**________ species is one that is new to an area, but does NOT cause any negative effects, while an ____**invasive**____________ species is one that is new to an area and also causes negative effects.
2. Which of these is the most common method for introduction of invasive aquatic (water) species (circle one)?

A. Imported with ornamental and nursery plants

B. Carried on the fur of agricultural animals (cows, sheep, etc.)

C. Attached to ship hulls or in ballast water

D. Sold in the aquarium trade

3. Which of these is NOT a problem caused by invasive species?

A. Destruction of crops

B. Appearance of new diseases and viruses

C. Pre-mature fruit ripening

D. Outcompeting native species for resources

4. Often it is difficult to eradicate an introduced or invasive species, why?
   Answers will vary. Example: It can be difficult to eradicate introduced or invasive species because they often go unnoticed for long periods of time in which they are able to reproduce and obtain large population sizes. Additionally, many of them can be very expensive to eradicate. For example, the earthworm is an invasive in North America, but find and removing all of the earthworms on this continent would prove impossible and radically expensive.
Introduction

In this activity you will learn the meaning of and potential negative effects associated with invasive species. You will play a game that has you acting as invasive species that is attempting to establish new populations around the world. Through this game you will gain knowledge on methods that invasive species use to travel to new areas and methods of prevention, control and eradication of invasives. Additionally, you will learn to distinguish introduced and invasive species and become familiar with several common invasives in North America.

Student Background Knowledge

Invasive and introduced species are responsible for many problems both economical and ecological throughout the world. Introduced species are defined as a species living outside its native distributional range, which has arrived there by human activity, either deliberate or accidental, that does not cause harm or negative affects to the environment. We are familiar with many types of introduced species without being aware of them, mainly because they are not causing problems. Some common introduced species in North America include dandelions, the house sparrow and domestic livestock such as cows.

Introduced species are also non-native organisms; however, they do cause damages. Some common damages include: destruction of crops, habitat alterations or loss, reduction or extinction of native species through competition or predation, and the introduction of new pathogens. Several well known invasive species in North America include: the Burmese Python, the Black Rat, the Kudzu plant and the African Killer Bee. It is important to familiarize ourselves with local invasive species so we can limit their spread and learn way to control their populations.
Vocabulary

Introduced Species: a species living outside its native distributional range, which has arrived there by human activity, either deliberate or accidental, that does not cause harm or negative affects to the environment

Invasive Species: an introduced species that causes harm or negative affects to the environment

Eradication: to remove completely; to eliminate or destroy (something harmful)

Safety Considerations

None.

Materials Checklist

<table>
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<tr>
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Procedure

11. Place cards upside down in 3 separate piles by color.
12. Each player draws one invasive species card. Others may see this card and you may not select another. You are stuck with the one you have!
13. Each player chooses a different cube color. These cubes will signify your invasion locations when placed on the board.
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16. Starting player chooses one playing card and follows the directions on the card. Make sure to read the card directions carefully. **CARDS MUST BE READ ALOUD.** If a
player is caught not reading the cards aloud during their turn they must remove 1 cube from the board.

17. Once their turn is complete the next player will draw a playing card and follow the directions.

18. Continue to choose playing cards and follow directions.

19. Playing cards and territory cards can be reshuffled and reused if necessary.

20. The game ends when one player has invaded the entire world and has the maximum cubes on every territory or if time is limited, the player that wins will be the one with the most cubes on the board when time is up.

**Notes on Game Board:**

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