Science Games for the Upper Elementary and Middle School Classrooms

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ORGANISM INTERACTION – Game One

Merely mentioning the possibility of playing a game is enough to grab the attention of many students. However, with the ever-present curriculum demands, finding time for games within a classroom can be difficult. Fortunately, allowing students to play games does not have to come at the cost of valuable learning time. Creating games that are aligned with the curriculum is an excellent way to provide fun learning opportunities for students. The following games, aligned with the Michigan Curriculum Framework Science Benchmarks, can be used as superb learning tools for students.

Recommended Grade Level

- 5th – 8th

MI Science Benchmarks

- LEC.III.5.M1 - Describe common patterns of relationships among populations.
- LEC.III.5.E1 - Identify familiar organisms as part of a food chain or food web and describe their feeding relationships within the web.

Objective

Because of its visual representation of the interactions between different organisms, this game will help students better understand symbiotic relationships among animals in an ecosystem.

Materials

- 5 small boxes
- interaction cards (template included)
- cardstock
- 7 different color groups of beads (30 per color)

Game Preparation

1. Using the cardstock, make five copies of the attached interaction cards.
2. Cut out the cards on each of the copies. The eight cards on each copy will be the cards for one group.
3. Place each of the eight cards into a small envelope. (1 title, 2 competition, 2 parasite, 1 predator, 1 mutualism, 1 commensalism)
4. Obtain 30 beads per organism interaction card. Each interaction card should have 30 of its own color bead. Consequently, each group's game should have a total of 210 beads of seven different colors.
5. Place one of the card envelopes and 210 beads in each of the five boxes. These boxes are now five complete sets of games.

Game Procedures

1. Obtain and open one game box.
2. Allow each player to pick a card out of the envelope.
3. Distribute 30 beads to each player. Everyone should have a different color bead.
4. At the same time, everyone should follow the instructions on their selected card and continuing doing so until the game is over.
5. If you lose all your beads, your organism is dead and you are out of the game.
6. The player with the most beads at the end of the game is the winner.

Reflection

In order to use this game to its fullest, some form of discussion should ensue the first time the game is used. The reflection may be intragroup, whole class, or independent. Among other things, some topics to address through reflection may include anything surprising about the game's winners and losers, how the game simulated true interactions between organisms, or what other important environmental factors were not taken into consideration in the game.

Classroom Idea Continued on next page →

WATER CYCLE MUSICAL CHAIRS—GAME TWO

Recommended Grade Level
- 3rd – 5th

MI Science Benchmarks
- EH.V.2.E1 - Describe how water exists on earth in three states.
- EH.V.2.E2 - Trace the path that rain water follows after it falls.

Objective
Acting as water droplets, students will circulate during musical chairs, trying to avoid "evaporating" into the clouds. Upon evaporating, students will have to wait their turn to precipitate. This representation of the water cycle will make the cycle a more concrete, tangible concept for students.

Materials
- Classroom chairs, enough for each student playing the game
- Music—radio, CD, etc.
- Sign labeled "Evaporation Station" (optional)
- Sign labeled "Lake Michigan" (optional)

Game Preparation
1. Place a few chairs in a straight row. (3-8 chairs, depending on number of participants)
2. Place the remainder of the chairs in a circle on one end of the row, leaving room between the row and the circle.
3. Obtain a radio and CD or another form of music.
4. Place the "Lake Michigan" sign inside the circle.
5. Place the "Evaporation Station" sign next to the row.

Game Procedures
1. Stand around the circle of chairs.
2. When the music starts, continue walking around the circle of chairs. When the music stops, sit in the chair within the circle that is closest to you.
3. If you do not have a seat in the circle when the music stops, you must move to the row of chairs and sit there. (evaporating from Lake Michigan)
4. If you are sitting in Evaporation Station, you may re-enter the circle, one person each time the music starts back up. (waiting to condense, precipitating)
5. New people entering Evaporation Station must sit at the end of the line.
6. Continue playing the game.

Reflection
Stopping the game when the first person moves to Evaporation Station will allow you to discuss the idea of evaporation— in this case a water droplet evaporating from Lake Michigan and coming to rest in a cloud. In addition, when the first person re-enters Lake Michigan, you can stop to discuss how the student had to wait to condense before he or she could precipitate back into the lake. These ideas can be verbalized entirely by the students playing the game.

If students desire to have a concrete goal in the game, make their motivation to stay out of Evaporation Station. Students who never enter the Station win the game.

ENERGY LEVELS GO FISH—GAME THREE

Recommended Grade Level
- 4th – 6th

MI Science Benchmarks
- LEC.III.5.E1 - Identify familiar organisms as part of a food chain or food web and describe their feeding relationships within the web.

Objective
By pairing up the different cards in this game, students will gain a broader exposure to the different organisms that can make up different energy levels.

Materials
- 1 package of plain index cards
- black marker
- magazines
- scissors
- markers
- glue stick

Game Preparation
1. Cut 26 index cards in half or obtain 52 full-size index cards.
2. Draw and label 13 different producers on 13 different cards.
3. Draw and label 13 different primary consumers on 13 different cards.
4. Draw and label 13 cards different secondary consumers on 13 different cards.
5. Draw and label 13 cards different decomposers on 13 different cards.
6. Laminate cards. (optional)

Game Procedures
1. Shuffle the cards and deal five cards to each player.
2. Place the leftover cards in a pile in the middle of the table.
3. The game begins with the player to the left of the dealer. Taking turns, each player asks the player on his or her left for a card with a particular energy level.
4. If the player does not have the card he or she was asked for, then he will say "go fish" to indicate that the other player should draw a card from the center pile. If the player has the card, then he should pass it to the player who asked for it.
5. If a player has or creates a pair of the same energy level anytime during his turn, he should place that pair on the table.
6. Continue until a player has no more cards, this person is the winner.

Reflection
A sample list of different organisms is included; however, the pictures for the cards should be hand-drawn, obtained online, or cut from magazines. Although many places online offer free pictures, the following sites are a few that would work nicely with this game.
- http://tolweb.org/tree/home.pages/randPic
- http://mbgnet.mobot.org
- http://www.ent.iastate.edu/imagegallery
- http://www.biologypics.com

Also, this game can be easily modified to work with any unit. Simply create pairs of corresponding cards. For example, a science unit dealing with the organization of living things could have a game with the terms vertebrate, invertebrate, cold-blooded, warm-blooded, mammal, bird, fish, reptile, amphibian along with cards of representative organisms.

SCIENCE DRAW AND GUESS—GAME FOUR

Recommended Grade Level
- K – 8th

MI Science Benchmarks
- L0.III.2.E1 - Explain characteristics and functions of observable body parts in a variety of animals.
- L0.III.2.E2 - Compare and contrast (K-2) or classify (3-5) familiar organisms on the basis of observable physical characteristics.

Objective
By playing this game, students are forced to access what they have already learned. The game requires them to remember not only the terms and concepts they have covered in the physical characteristics lessons, but also the ideas related to them.

Materials
- Draw and Guess template or index cards and a marker
- scissors
- dry erase board and markers or chalkboard and chalk or easel paper and markers
- envelope
- container to hold index cards

Game Preparation
1. Cut out provided cards or create a set of cards by writing one term or concept per index card.
2. Until they are used, place the cards in a envelope labeled with the unit or lesson from which they are obtained.

Game Procedures
1. Place the cards for the review into a container.
2. Divide the class into two teams.
3. Working from right to left, have a member of one team come pick a card and attempt to draw that term or concept on the board.
4. The team of the person drawing should guess what is being drawn. The other team must remain quiet.
5. If the team guesses the concept or term, they must then tell something about it in order to get a point.
6. If the guessing team either cannot guess the picture or cannot provide a fact about the term or concept, the other team gets one chance to do so. Whichever team can provide an accurate fact gets the point.
7. Alternate between both teams, making sure that each player is given a chance to draw.

Reflection
Although the template included focuses on characteristics of animals, this game can be used to review concepts from any lesson. Storing the cards in envelopes labeled with the corresponding unit will help make the game accessible. Then it is easy to pull out the game when there is extra time or to allow students to play during recess.

These four games join the company of many other published, curriculum-aligned educational games. For many years, teachers have been creating superb games for use within the classroom. Such games are readily available in journals, magazines, and on online. To find other games or to learn how to make your own games, visit the following websites:
- http://www.csun.edu/~vceed002/ref/games/index.html
- http://www.prek-12engineering.org/data/d55/Recycling.pdf
- http://www.funattic.com/game_learning.htm
- http://www.centerofweb.com/kids/games