



HANDS-ON SCIENCE ACTIVITIES



Activity 9

Polar Bears Go with the Floes

For use with participants ages 11 to 13



LUNAR AND
PLANETARY
INSTITUTE



ALA American
Library
Association



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Discover Earth Themes and Overview of Activities

The *Discover Earth* activities focus on Earth science topics close to home – such as local weather and the plants, animals, crops, and environmental features particular to your region – as well as a global view of our changing planet. Through hands-on investigations and discussions, young audiences discover that Earth’s global environment changes – and is changed by – the local environment. The activities explore three key messages relating to this overall theme: A. We belong to Earth; B. Each region is unique; and C. Your home is changing. These messages all relate to the overall theme: Earth’s global environment changes – and is changed by – the local environment. The activities were developed with guidelines set forth by the National Science Education Standards and American Association for the Advancement of Science (AAAS) benchmarks, and they were designed for audiences in the following four age ranges: 5 to 7, 8 to 9, 10 to 13, and teens.

Overall Theme

Earth’s global environment changes – and is changed by – the local environment.

A. We Belong to Earth

We belong to a complex system of interacting water, ice, air, and life.

Community Activities

The community contributes to two exhibits: In *Century of Change Display*, the community gathers and compares photos and/or illustrations of the local areas taken a century and more ago with more contemporary photos of the same areas. In *Weather Wall*, children track the local weather over a period of two months or more, plotting weather data on a kid-friendly sticker chart.

Icebreaker Activities

Children ages 5 and up are introduced to Earth’s major characteristics (or parts or systems) -- water, ice, air, and life – through the brief icebreaker activities *Catch!...the World’s Ocean*, *Ice-y Experience*, *Share the Air*, and *Web of Life*.

Discover Earth through Reading

I Belong to Earth can serve either as part of a kick-off celebration or as an outreach program to area schools. Children and teens discover Earth science questions and answers using the library’s resources and participate in reading games — customized for ages 5 to 9, 10 to 13, and teens — that combine book lists and reading logs into take-home adventures! After this activity, the reading



games continue to connect patrons with the *Discover Earth* activities and resources. Participants advance by reading, engaging in suggested at-home activities, attending *Discover Earth* library programs, or investigating Earth and the environment through a variety of citizen science programs. Completed game boards may be submitted to the library for display, and if desired, entry into promotional drawings. Participants earn a decal upon completion.

B. Each Region Is Unique

Changes to distant oceans, air moving freely around our globe, and all living things have an influence on our regional environment, now and in the past and future.

Weather Explorations

Children ages 5 to 7 explore various aspects of weather through a series of stations featuring games, crafts, and weather observations in *Weather: The Many Faces of Mother Nature*. Children ages 8 to 9 and 10 to 13 undertake more advanced investigations of rain, wind, clouds, and weather instruments and consider how locally collected weather data relate to the broader Earth systems of water, ice, air, and life in *Weather Stations*.

Regional Explorations

In *Climate Tour*, children ages 10 to 13 celebrate their region of the United States by creating a regionally-inspired postcard and recipe. Finally, they use a set of *What if...* cards about their region to reconsider their postcards and recipes in light of future climate change. In *Polar Bears or Penguins?*, children ages 10 to 13 use a fast-action matching game to demonstrate how each of Earth's polar regions is distinct and special.

C. Your Home Is Changing

Earth's water, ice, air, and life will continue to interact over long-term scales, shaping the particular features of that place we each call home.

Environmental Stewardship

In teams, children ages 11 to 13 build an understanding of how human actions impact global change by playing a board game, *Polar Bears Go with the Floes*, in which chance and choice determine the fate of a lone polar bear on an ice floe. Teens, ages 14 to 18, engage their communities in science through art in *Earth: Artistically Balanced*. The teens first interact with a climate scientist to unravel, on a very basic level, the complexities of Earth's climate system, and then they create a three-dimensional artistic representation of Earth's climate. The art may be created on a large scale and displayed at the library or made on a smaller scale to take home.



How to Use These Activities in Your Programs

You may design your own program of one or more of these flexible activities, or you may choose to build the story of Earth and its changing environment through the complete series of activities! Background information and facilitator resources are provided to help you prepare to lead the activities. Encourage further exploration with the books, websites, and videos listed in the *Facilitator's Resources* packet. Programming ideas for all ages, infant to adult, are also provided.

Reading games, geared toward different age levels, support this module and connect the activities and resources. The games combine the traditional reading log and book list into a board game, where participants advance by reading, engaging in suggested at-home activities, attending library programs, or investigating Earth and the environment through a variety of citizen science programs. These games are introduced in Activity 4: *I Belong to Earth*. The game boards may be customized with your institutions' address, and if desired, an additional step in the instructions for winning prizes. Matching decals may be printed and awarded as prizes. *Read Me* bookmarks are available as a way for children to read, review, and recommend titles to others. These materials (shown below), including the supporting book lists, are available free for educational use at www.lpi.usra.edu/explore/discoverEarth.





Correlations to National Standards

National Science Education Standards

Grades 5-8

Life Science - Content Standard C

Understanding Regulation and Behavior

- All organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment.

Understanding Populations and Ecosystems

- The number of organisms an ecosystem can support depends on the resources available and abiotic factors, such as quantity of light and water, range of temperatures, and soil composition. Given adequate biotic and abiotic resources and no disease or predators, populations (including humans) increase at rapid rates. Lack of resources and other factors, such as predation and climate, limit the growth of populations in specific niches in the ecosystem.

Understanding Earth's History

- The earth processes we see today, including erosion, movement of lithospheric plates, and changes in atmospheric composition, are similar to those that occurred in the past. Earth history is also influenced by occasional catastrophes, such as the impact of an asteroid or comet.

Science in Personal and Social Perspectives - Content Standard F

Understanding Populations, Resources, and Environments

- Human activities also can induce hazards through resource acquisition, urban growth, land-use decisions, and waste disposal. Such activities can accelerate many natural changes.
- Natural hazards can present personal and societal challenges because misidentifying the change or incorrectly estimating the rate and scale of change may result in either too little attention and significant human costs or too much cost for unneeded preventive measures.

Understanding Risks and Benefits

- Risk analysis considers the type of hazard and estimates the number of people that might be exposed and the number likely to suffer consequences. The results are used to determine the options for reducing or eliminating risks.



- Students should understand the risks associated with natural hazards (fires, floods, tornadoes, hurricanes, earthquakes, and volcanic eruptions), with chemical hazards (pollutants in air, water, soil, and food), with biological hazards (pollen, viruses, bacterial, and parasites), social hazards (occupational safety and transportation), and with personal hazards (smoking, dieting, and drinking).
- Important personal and social decisions are made based on perceptions of benefits and risks.

Understanding Science and Technology in Society

- Science influences society through its knowledge and world view. Scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment. The effect of science on society is neither entirely beneficial nor entirely detrimental.
- Societal challenges often inspire questions for scientific research, and social priorities often influence research priorities through the availability of funding for research.



Activity Procedure

Overview

In this 45-60 minute "high-stakes" board game, everyone wins or everyone loses! As they play, groups of three to four children ages 11 to 13 build an understanding of how human actions impact global change. As teams, children play a game in which chance and choice determine the fate of a lone polar bear on an ice floe!

What's the Point?

- Children determine concrete actions they — along with their families and schools — can undertake as global stewards.
- Human actions have a tremendous impact on the global environment and those ecosystems it supports, particularly the fragile Arctic and Antarctic ecosystems.
- Melting sea ice (floes) not only affects aquatic ecosystems, but mammals and birds and other organisms as well
- The choices we make now will affect our world, either positively or negatively, in the future — but not all choices are easy. Some choices require us to make changes in the way we live.

Materials

Facility Needs

- Areas where groups of three to four children can sit and play a board game

For Each Group of Three to Four Children

- 1 (11" x 17") *Polar Bears Go With the Floes* game board, printed in color (select "fit to size of paper" when printing)
- 1 set of ice floe puzzle pieces, printed on cardstock
- OR
- 1 set of ice floe puzzle pieces, printed on paper as a template
- 1 (9" x 12") sheet of white craft foam
- 1 set of game pieces, printed in color on cardstock
- 1 deck of game cards, printed double-sided and in color on cardstock
- A *Rules of the Game* sheet
- 1 die



For Each Child

- Optional: His/her *Discover Earth* reading game board

For the Facilitator

- Facilitator's Resources* packet (available at www.lpi.usra.edu/explore/discoverEarth), which includes:
 - Background information
 - Be a Science Guide!*
 - Resource lists
 - Shopping list
- Resources for discussing the implications of climate change, such as:

KIDS' QUESTIONS ABOUT GLOBAL WARMING

http://online.nwf.org/site/PageNavigator/ClimateClassroom/cc_kids_questions

This National Wildlife Federation *Climate Classroom* resource provides the answers to children's and teens' common questions about global warming.

- Scissors
- Tape
- Marker

Preparation

- Review the *Facilitator's Resources* packet, resources for discussing the implications of climate change, and *Rules of the Game*.
- Make copies of the game board, *Rules of the Game* sheet, puzzle pieces, polar bear cards, and both identical sets of game pieces.
- Cut out a set of ice floe puzzle pieces for each group. To make the foam puzzle pieces, tape the ice floe puzzle pieces template to the craft foam in a few places and cut it out.
- Assemble one set of game pieces out of duplicate sets of animal images: Tape each identical image back-to-back. Fold the game pieces where indicated.
- Prepare an area large enough for groups of three to four to play the game on tables or the floor.



Activity

1. **To introduce the activity, invite the children to play a "high stakes" board game — *Polar Bears Go with the Floes* — in which everyone wins or everyone loses!** They will work together as a team to determine whether or not to save a polar bear on an Arctic sea ice floe.
 - Do you know — or recall from what you learned in *Polar Bears or Penguins?* — where polar bears live? *Polar bears live in the Arctic, in the north polar region.*
 - Do you know what an ice floe is? *Accept all answers.*

If necessary, explain that an ice floe is a thin, flat piece of floating ice.

2. **Prompt a discussion about what is happening to ice on our Earth.** Explain that scientists are observing changes to the ice sheets, glaciers, and sea ice on Earth — most are melting (i.e., getting smaller). Earth's global temperatures are getting warmer, in part, because carbon dioxide (CO₂) and other heat-trapping gases are increasing in our atmosphere. When we drive cars using gasoline or burn coal for electricity, we add carbon dioxide to the atmosphere. In general, the sea ice — the thin layer of ice that forms from the chilled ocean water — in the Arctic is getting thinner and smaller and melting earlier each spring.
 - What animals living in the Arctic might be affected by the sea ice getting smaller? *The children may say whales and seals and polar bears. If they name animals that belong on the tundra (for example caribou), let them know that these animals do live in the Arctic, but not on or around the floating sea ice. If they say penguins, remind them that penguins live in Antarctica, not the Arctic (and penguins are much happier because they have never met a polar bear!).*
 - What ideas do you have about how the changes to sea ice affect the polar bears or other animals?

Share with the children that polar bears rely on sea ice to have dens where they hibernate and where their cubs are born. Sometimes these dens can be several hundred miles from the coastline. They also use the sea ice to hunt seals. If the sea ice melts too much, it will not support their weight as they wait for seals to come out of the water. If the sea ice melts too early, they will not be able to hunt at all when they come out of hibernation. With the decreasing ice, polar bears are having to swim farther distances to move from floe to floe.

- Is there anything that we can do — as individuals — to help decrease the amount of carbon dioxide going into the atmosphere? *Some children might suggest that we drive less. Others may have ideas about turning lights off or using fluorescent light bulbs.*



Help the children make the connection between our use of energy and our use of fossil fuels. Often our electricity is generated by burning coal, so every time we turn on a light bulb or turn on the air conditioner in the summer, we are using electricity that was produced by burning fossil fuels and releasing carbon dioxide into the atmosphere. By making careful choices in our daily lives — even some that do not seem connected to directly using fossil fuels, such as recycling or composting — we can make a difference to the entire Earth — and to the polar regions!

3. **Divide the children into groups of three to four players and distribute the game board, *Rules of the Game* sheets, game pieces, cards, puzzle pieces, die, and polar bears.** Show the children how to set up their boards, ice floe puzzles, and the polar bear for the center of the game board, and invite them to choose their game pieces. They may choose from the following animals:
 - Caribou (these animals are called reindeer in Europe)
 - Arctic wolf
 - Beluga whale
 - Walrus
 - Polar bear
 - Ringed seal
 - Orca (killer whale)
 - Snowy owl
 - Arctic fox
4. **Review the *Rules of the Game* with the children.**
5. **Play the game!**

Conclusion

Regroup with the children and invite them to share things they can do to help reduce global warming. Encourage them to think about what they read in the game.

Together, review and discuss some of the ideas provided on the “Green Points” cards.

- What are you doing already? If you shower, how long are your showers? Do you recycle? Do you do your own laundry, and if so, do you use warm (not hot) water and hang your clothes to dry instead of using a dryer? What kind of light bulbs do you have in their lamps in your rooms? Do you ask for a car ride to places where you could safely walk or bicycle?
- What might you be able to do? Can you check that your water heater is insulated and not wasting energy by losing unnecessary heat? Can you speak with your



families to discuss lowering the heat in the winter or raising the temperature a bit in the summer?

It is important to let the children know that they — not just adults — can make a difference and help decrease carbon dioxide emissions by making careful choices and by encouraging others to do the same. Just like in the game, we all have to work together to make a difference!



Contact Information

Your questions and comments about the *Discover Earth: Hands-on Science Activities* are welcome!

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STAR_Net Project Overview

The *STAR Library Education Network* project (*STAR_Net* for short) is part of a national initiative to support libraries that are already providing informal STEM learning, or want to provide it. The *STAR_Net* project has a number of components, including:

- Two traveling exhibits for libraries: *Discover Earth: A Century of Change*, and *Discover Tech: Engineers Make a World of Difference*.
- An Education Program, which includes developing exemplary hands-on activities for libraries, as well as conducting training (both online and in-person) for library staff.
- An Outreach Program that helps libraries to develop STEM programming and find local partners for collaborations on programming.
- An online Community of Practice (CoP) (<http://community.discoverexhibits.org>) for librarians (both hosts and non-hosts of the exhibits) and STEM professionals who want to support STEM programming in public libraries.

The National Science Foundation (NSF) provided funding the *STAR_Net* project. *STAR_Net* is led by the National Center for Interactive Learning (NCIL) at the Space Science Institute. Dr. Paul Dusenbery is the project director. STAR stands for “Science-Technology Activities and Resources.” In addition to NCIL staff, the project team includes:

- The American Library Association (ALA), which is managing the exhibit tours and helping to raise awareness among librarians of the many opportunities for providing STEM programming



- The Lunar and Planetary Institute (LPI), which is leading the Education Program component. For some years, LPI has led the *Explore* program for libraries, which has been at the forefront of developing STEM programming and training for librarians.
- The National Girls Collaborative Project (NGCP), which is leading the project's Outreach Program. As a project partner, this NSF-funded project is helping libraries across the country partner with a variety of organizations to provide STEM programming.
- NCIL's Kate Haley Goldman and staff from Evaluation and Research Associates are conducting evaluations of the project's components. The project also includes a research component that explores how public libraries can serve as STEM learning centers in rural, under-served communities. The evaluation and research results will be shared with the informal science education community.

The activity described in this packet was developed for libraries to use in support of the *Discover Earth* traveling exhibit, though it may be implemented independently.

Online Community

Librarians, scientists, engineers, educators, museum staff, and others are invited to join the *STAR_Net* online community! The website fosters collaboration among professionals who want to provide or support Science, Technology, Engineering, and Mathematics (STEM) learning experiences in libraries. The *STAR_Net* project team hopes you find the following activity useful. Please join the online community (<http://community.discoverexhibits.org>) and share your experiences implementing it with your colleagues.

For more information about the *STAR_Net* project, please contact:

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Field Tests

Appreciation is extended to the librarians who field tested the materials in their children's, youth, and teen programs.

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Appendix: Activity Materials to Print

Arctic Sea

POLAR BEARS GO WITH THE FLOES!

Sit and chill with the arctic owl



Fact
pay 10,000 points

Fact
pay 10,000 points

Fact
pay 20,000 points

Fact
pay 20,000 points



save me!

Fact
pay 10,000 points

Fact
pay 10,000 points

Fact
pay 20,000 points

Fact
pay 30,000 points

Fact
pay 10,000 points

Fact
pay 20,000 points

Fact
pay 10,000 points

Fact
pay 20,000 points

Fact
pay 10,000 points

Fact
pay 20,000 points

Did you save the polar bear?

START

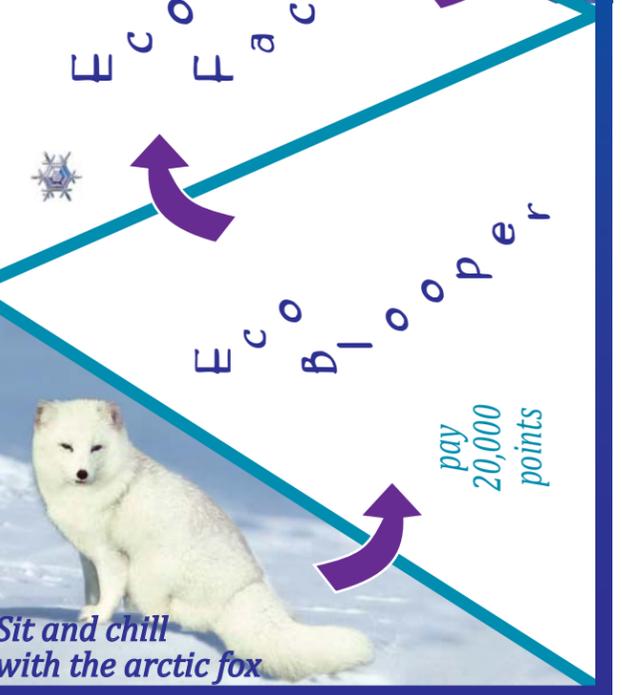
FINISH

Fact
pay 10,000 points

Sit and chill with the arctic fox

Fact
pay 20,000 points

Sit and chill with the killer whale

Player game pieces — cut out and fold base under

| | | |
|---|--|---|
|  |  |  |
| fold under for base | fold under for base | fold under for base |
|  |  |  |
| fold under for base | fold under for base | fold under for base |
|  |  |  |
| fold under for base | fold under for base | fold under for base |

Polar Bear floats on ice on center of game board. Cut out and fold base under.



Player game pieces — cut out and fold base under

| | | |
|---|--|---|
|  |  |  |
| fold under for base | fold under for base | fold under for base |
|  |  |  |
| fold under for base | fold under for base | fold under for base |
|  |  |  |
| fold under for base | fold under for base | fold under for base |

Polar Bear floats on ice on center of game board. Cut out and fold base under.



Cut along dashed lines and use cards with game board.

Eco
BLOOPER

Cut along dashed lines and use cards with game board.

You just went to the grocery store and bought beef and pork — producing these red meats emits more greenhouses gases than for fish and beans. Choose seafood for a healthy protein.

The “Eco-Friendly Squad” visited your house and found that you left your computer and entertainment center on standby! Clocks and “standby” settings use electricity even when electronics are off.

Oops!
The Sunday paper just went out with Monday’s trash.

Oh no! Another ice shelf just broke apart in Antarctica. In 2002, another large floating sheet of ice, called the Larsen B Ice Shelf, collapsed because of climate changes.

Your school cafeteria does not have recycling bins. Convince your fellow teachers and students to install bins in your cafeteria and school yard.

Last year your family, if it is like most, threw out 88 pounds of plastic — all made from fossil fuels. This year, recycle plastic containers, use reusable shopping bags, and don’t buy stuff in plastic if you can avoid it.

The fertilizers you use leak chemicals into the environment and cause the release of nitrous oxide — a greenhouse gas. Start a compost pile (recycle your food) to fertilize your garden.

You are wasting gasoline!
The tires on your family’s car are low and the engine needs a tune-up.

Your lemonade stand uses styrofoam cups, made in part from fossil fuels, instead of cups made from recycled paper.

Cut along dashed lines and use cards with game board.

Eco
BLOOPER

Eco
BLOOPER

Eco
BLOOPER

Eco
BLOOPER

Eco
BLOOPER

Eco
BLOOPER

Cut along dashed lines and
use cards with game board.

Eco
BLOOPER

Cut along dashed lines and use cards with game board.

Your family buys small bottles of water every day instead of refilling reusable water bottles. All those plastic bottles are made using fossil fuels and most are not recycled.

Your family often runs the dishwasher when it is only partially full. Filling the dishwasher and using low energy settings will save money and burn less fuel.

Your purchases at the store are put into many, many plastic bags. Reduce packaging! Put more in one bag — or even better, use reusable cloth bags!

Instead of putting on a sweater in the winter, your family turns up the heat, burning more fossil fuels.

You can't make up your mind about what you want for a snack, so you leave the refrigerator door open while you search. The refrigerator wastes energy and has to work harder to cool everything inside.

Your long shower and high-flow shower head waste water and the energy it takes to heat the water. Spend the time you need to get clean and then get out!

You know lots and lots of ways to save energy and you don't share them with your friends and family.

Cut along dashed lines and use cards with game board.

Cut along dashed lines and use cards with game board.

Eco
FACT

Cut along dashed lines and use cards with game board.

Use CFBs!
Compact fluorescent bulbs last 10 times longer than incandescent bulbs and use 65% less energy! (LEDs are also "green.")

Use CFBs!
Replacing just *one* 60-watt incandescent bulb with a compact fluorescent bulb saves your family \$30.00 over the life of the bulb.

Washing your clothes with warm water, rather than hot, and hanging them outside to dry will reduce the amount of CO₂ your family's laundry produces by 95%!

If you can feel the heat from your family's water heater, you need to insulate it to reduce the water heater's CO₂ emissions by 7%.

Recycle!
The energy we save by recycling even *one* glass bottle is enough to light an incandescent light bulb for *four* hours!

Eating less red meat is one of the best ways to reduce your family's greenhouse gas emissions! Cows "emit," to put it politely, the greenhouse gas methane to the atmosphere.

Recycle!
The amount of wood and paper we throw away every year is enough to heat 50 million homes for 20 years!

Recycle!
Every ton of paper that is recycled saves 17 trees.

Fruit, vegetable, and bean production creates less greenhouse gases than for red meat or chicken.
Eat more greens — and be Green!

Cut along dashed lines and use cards with game board.

Eco
FACT

Eco
FACT

Eco
FACT

Eco
FACT

Eco
FACT

Eco
FACT

Cut along dashed lines and
use cards with game board.

Eco
FACT

Cut along dashed lines and use cards with game board.

Unplug!
Unplugging computers, TVs, and other electronics can cut their electrical draw by almost 15%!

Recycle!
2.5 *million* individual plastic water bottles are thrown away every hour in the United States!

Recycle!
Making paper products from recycled paper uses 60% less energy than making paper products from trees.

Recycling just one run of Sunday newspapers in the U.S. could save more than 50,000 trees.

Even if your family doesn't own a hybrid, you can still help reduce greenhouse gas emissions and increase mileage by 3% if your family keeps the car tires inflated properly.

Stay Clean...
but shower less! Shortening your shower time even a few minutes saves water and reduces greenhouse gases released from heating the water.

Seventy percent of the electricity produced in the United States is from burning fossil fuels like coal, which adds greenhouse gases to the atmosphere.

Cut along dashed lines and use cards with game board.

Cut along dashed lines and use cards with game board.

GREEN
POINTS

Cut along dashed lines and use cards with game board.

– 10,000 Points –

Your family started replacing incandescent light bulbs with compact fluorescent light bulbs, reducing the energy you use and saving money!

– 10,000 Points –

You used a microwave, rather than an oven, to cook up a healthy after-school snack. A microwave uses one-third or less of the energy of an electric oven.

– 10,000 Points –

The Eco-Club just placed recycling bins in all classrooms. Recycling saves energy by not having to make a product from scratch.

– 10,000 Points –

You and your family turn your thermostat down by just two tiny degrees in the winter to reduce your electricity use and save money. You have reduced your CO₂ emissions for temperature control by 10%.

– 10,000 Points –

You only spent 10 minutes in the shower, instead of 20. You saved water, reduced the energy it takes to heat the water, and cut the CO₂ you produced showering by 50%.

– 10,000 Points –

Your family decided to drive less and walk more. You reduced the amount of gasoline used, cut the amount of CO₂ released into the atmosphere, and got into better shape!

– 10,000 Points –

You just chose to buy recycled paper for your computer.

– 10,000 Points –

Your family combines driving errands so you make fewer trips. This reduces the amount of gasoline used and the amount of greenhouse gases released into the atmosphere.

– 10,000 Points –

You start a carpool to get to school. Your father drives you and three friends who live nearby to school instead of each of you being driven separately every day.

Cut along dashed lines and use cards with game board.

GREEN
POINTS

GREEN
POINTS

GREEN
POINTS

GREEN
POINTS

GREEN
POINTS

GREEN
POINTS

Cut along dashed lines and
use cards with game board.

Use your Green Points wisely
to help save the Polar Bear!

GREEN
POINTS

Cut along dashed lines and use cards with game board.

– 10,000 Points –

Your family started a compost pile and will use it to fertilize your garden. Bonus! You have a garden and are eating “local”!

– 10,000 Points –

Your mother starts taking the bus to work, instead of driving, so she saves gas and puts less CO₂ into the atmosphere.

– 10,000 Points –

You shop at the cool re-sale store in town and buy vintage clothing. Not only do you look marvelous, but you have not caused energy to be wasted in producing new clothing.

– 10,000 Points –

You and several friends carpooled to the local farmer’s market and bought produce grown locally. You helped to reduce the energy wasted on long-distance transport.

– 10,000 Points –

You and your family turn your thermostat *up* by just two tiny degrees in the summer and reduce your electricity use. This cuts your CO₂ emissions for temperature control by 10%.

– 10,000 Points –

You just shared a report with friends about the Arctic sea ice melting more each year and the danger to polar bears. They were inspired to convince their families to switch from incandescent bulbs to energy-efficient fluorescent bulbs!

– 10,000 Points –

You just planted a tree. It will help reduce CO₂ in the atmosphere by using that CO₂ to grow!

**Cut along dashed lines and
use cards with game board.**

**Use your Green Points wisely
to help save the Polar Bear!**

POLAR BEARS GO WITH THE FLOES

RULES OF THE GAME

OBJECTIVE: Work together as a team to keep the sea ice intact under the polar bear.

SET UP: Put the ice floe puzzle pieces together, place the puzzle in the middle of the board, and place the polar bear on the ice floe. Shuffle the deck of “Green Points” game cards and deal each player four cards. Shuffle the “EcoFact” and “EcoBlooper” game cards and place them on the card sheet.

RULES OF THE GAME:

1. Roll the die to determine who goes first, then proceed clockwise from player to player. On each turn you should roll the die and advance the number of squares indicated.
2. If you land on an EcoFact, pick an “EcoFact” card and read it to the rest of the team, then return it to the bottom of the pile.
3. If you land on an EcoBlooper, you have three choices.
 - ☞ Pay the number of points indicated on the square (resolving environmental problems is costly!).
 - ☞ Go back five squares. You may only use this option twice. If there are not five squares behind you, then you must choose another option.
 - ☞ Remove a piece from the ice floe puzzle (keep it with your “Green Points” cards).
4. Place all used “Green Points” cards in the discard pile on the card sheet. They can only be used once.
5. Once you are out of cards totalling the number of points you need, you may ask other teammates to contribute. More than one teammate may contribute, although no teammate has to contribute.
6. All players must reach the last square before the game concludes. Players who are on the last square may still share “Green Points” with players in need.
7. If there is at least one piece of the ice floe left for the polar bear when all players are on the last square, everyone wins. Players tally their “Green Points” left at the end of the game (each player with a piece of ice in their possession loses 10,000 points for each piece) and the player with the highest number of points remaining is the **Big Winner!**
8. If the final piece of the ice floe is removed before all players reach the last square, everyone loses, even the player with the most points.

PLAY POINTERS:

- ☞ There are many factors to be weighed, and choices to be made, when you land on an EcoBlooper. Giving up points is hard, but may allow you and your teammates to win in the end! Moving back may lessen your chances of being the **Big Winner**, but may improve the chances of everyone, including you, winning!
- ☞ You can say “No” to a teammate who asks you to contribute points. You may suggest that he/she choose the option of moving back five squares if he/she has not already done so twice.
- ☞ Don’t take it personally if one of your teammates says “No” to your request for points. They may have a different strategy than you.
- ☞ Remember that you are working together as a team toward a common goal.

Put

EcoFacts

Here

Used cards go to the bottom of the pile.

Put

EcoBloopers

Here

Used cards go to the bottom of the pile.

Put

Used Green Points

Here