



SCIENCE

FOR FAMILIES

PRE-KINDERGARTEN

What to expect:

Science is particularly important in pre-kindergarten because at this age, children have a natural curiosity about the world around them and are eager to learn. Pre-K students should be encouraged to make observations and describe how they are interacting with their surroundings. Provide positive responses when they say things like “A plastic spoon feels different than a metal spoon,” “I am warmer when I put on a coat” and “A puddle splashes when I jump in it.” This information is a snapshot of learning in science for pre-kindergarten. For a complete set of science academic standards, [click here](#) or visit sde.ok.gov/oklahoma-academic-standards.

By the end of the school year, your child will:

- Show their curiosity about the natural world (plants, animals, etc.) while playing and using their senses (sight, sound, smell, touch and taste).
- Begin to participate in simple investigations like predicting what might happen next and testing their observations. (For example, students might roll a toy car down a ramp and test what makes the car go faster or slower.)
- Start putting items that are important in their world (toys, pets and foods, for example) into categories based on things they observe about them.
- Talk about major features of the Earth’s surface (streams, hills, etc.) found in the natural world around them.

What to do at home:

- Ask questions about the things your child is interested in and what they are observing about the world. (For example, if your child says, “Look at the puppy!” ask them what color the puppy is or what made them notice it.)
- Describe where to find familiar plants and animals in your neighborhood or area.
- Talk about things your child notices about the different seasons.
- Encourage questions and make time for problem-solving to help your child find answers to questions. (For example, if your child notices ice melting in their cup, you could ask them why they think this is happening and how to make the melted ice solid again.)

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Fostering Curiosity

Children are naturally curious and are motivated to learn about things that interest them. Since curiosity contributes to success in the classroom, it is important to encourage it at home. Play is a wonderful way to nurture curiosity in young children, so be sure to allow plenty of playtime. Encourage your child to ask questions, discover answers and explore their world.

Support your child's curiosity with questions like these:

- When you look around, what things do you see that are alike and different?
- What do you see when you look outside?
- What do you like to do?

Your child will have plenty of questions. It's okay if you don't always have the answer. The best response is always, "Let's find out together."

Fostering Communication

Build your child's vocabulary, thinking skills and curiosity by using new words and having conversations that include questions to make your child think. Communicating with others gives children a chance to see and understand that there can be more than one point of view about a given subject. Accepting different ideas helps children learn how to get along with others, encouraging positive relationships with other children and a strong self-image.

Support your child's communication skills with questions like these:

- What fruit would you like to eat for lunch? Why?
- Do you think you will need a jacket today? Why or why not?
- What was your favorite part of the day and why?
- How did you help someone today?

Fostering Connections

Making connections between different school subjects helps build your child's overall knowledge and learning. It's also important for your child to make connections between what they are learning at school and in the real world. Point out these connections to your child and encourage them to make them, too.

- Connect science with writing and art by asking your child to draw pictures of the things they see in the world around them (for example, leaves change color, some animals have fur and others do not, etc.) and add words to the picture that describe the things they notice and wonder about.
- Connect science with engineering by asking your child what they notice and wonder about (for example, "Does it feel hot when we sit in the sun and not in the shade?"), then discuss what causes the things they notice, how they work or how they could be changed to work better. (For example, if you asked your child what kinds of things could block the sun from making us feel hot, your child could design and build a structure to block the sun.)

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KINDERGARTEN

What to expect:

Kindergarten is when children are beginning to grow academically, socially and emotionally in a structured learning environment. Families play an important role in that growth as they model positive learning behaviors and become involved in school activities. Science can encourage this natural curiosity and help it grow. Ask your child questions like “What happens if you push or pull an object harder?”, “Where do animals live, and why do they live there?” and “What is the weather like today, and how is it different than yesterday?” This information is a snapshot of learning in science for kindergarten. For a complete set of science academic standards, [click here](#) or visit sde.ok.gov/oklahoma-academic-standards.

By the end of the school year, your child will:

- Identify patterns and changes in local weather and describe how weather forecasts help us to prepare for and respond to severe weather.
- Understand how different strengths or directions of pushes and pulls change the motion of an object. (For example, students might observe what happens when a soccer ball is kicked in one direction, and then is kicked harder in the opposite direction by another player.)
- Explain what plants and animals (including humans) need to survive and describe the relationship between their needs and where they live.

What to do at home:

- Draw what the weather looks and feels like several days in a row.
- Kick a soccer ball and talk about how a harder kick makes the ball go farther.
- Walk around your neighborhood or a local park and name the animals and plants you see, then talk about why the neighborhood or park is a good place for them to live.



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Support your child's curiosity with questions like these:

- What do you wonder about?
- What patterns do you see when you look outside? (For example, trees are moving away from the direction of the wind.)
- What book do you want to read today? Why?

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Fostering Communication

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Support your child's communication skills with questions like these:

- What is your favorite food and why?
- What rule have you followed today?
- What do community helpers do for people?
- How did you help someone today?

Fostering Connections

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- Connect science with writing and art by asking your child to draw pictures of the things they see in the world around them (for example, leaves change color, some animals have fur and others do not, etc.) and add words to the picture that describe the things they notice and wonder about.
- Connect science with engineering by asking your child what they notice and wonder about (for example, "Does it feel hot when we sit in the sun and not in the shade?"), then discuss what causes the things they notice, how they work or how they could be changed to work better. (For example, if you asked your child what kinds of things could block the sun from making us feel hot, your child could design and build a structure to block the sun.)

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FIRST GRADE

What to expect:

In first grade, children are becoming more independent as their reading skills improve and they are able to focus for longer periods of time. Building on skills learned in kindergarten, first-graders are continuing to understand more about the world around them and are active learners who are doing science to learn science. By observing the world, first-graders can come up with possible answers to questions such as “What happens when materials vibrate?”, “What are some ways plants and animals meet their needs so they can survive and grow?”, “How are parents and their offspring alike and different?” and “What objects are in the sky and how do they seem to move?” First-graders will be active learners who are doing science to learn science. For a complete set of science academic standards, [click here](https://sde.ok.gov/oklahoma-academic-standards) or visit sde.ok.gov/oklahoma-academic-standards.

By the end of the school year, your child will:

- Investigate the relationship between sound and vibration and the connection between light and our ability to see objects.
- Increase their understanding of how plants and animals use the outer parts of their body to help them survive, grow and meet their needs.
- Learn how parents help their offspring survive through adaptation (for example, when a mother animal hears its offspring cry, it provides food) and study how young plants and animals are similar to, but not exactly the same as, their parents.
- Observe, describe and predict patterns in the movement of objects in the sky (the moon, stars, sun, etc.).

What to do at home:

- Help your child explore the sounds made by everyday objects and instruments, and ask them to identify the different sounds. (Examples of vibrating materials that make sound include a stretched rubber band and a plastic container with a lid.)
- Go on nature walks. Ask your child to describe parts of plants and animals and how they might help them survive. (For example, your child could point out that a rose has sharp thorns that hurt, which might keep an animal from eating them.)
- Go to the zoo or watch videos of baby animals and their parents and describe how they interact. Ask your child how the baby animals and parents look alike and different.
- Observe the sun, moon and stars often and ask your child to describe the differences in their appearance or location from observation to observation.

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Support your child's curiosity with questions like these:

- What are you interested in knowing more about?
- What else does that make you think of?
- Where do you think we can learn more about these things?

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Support your child's communication skills with questions like these:

- Who did you play with today? What did you play?
- What was your hardest rule to follow today? Why was it hard?
- What was your favorite part of the day and why?
- Can you tell me an example of kindness you saw and/or showed today?

Fostering Connections

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- Connect science with writing and art by asking your child to draw pictures of the things they see in the world around them (for example, sometimes we see shadows and sometimes we don't, animals live in different places, etc.). Then, ask them to add words and phrases to the picture that describe the things they notice and wonder about and what might cause them or how they work.
- Connect science with engineering by asking your child what they notice and wonder about (for example, "Do you notice that dirt is carried to a new place after it rains a lot?"), then discuss what causes the things they notice, how they work or how they could be modified to work better. (For example, if you asked your child what could help keep the dirt in its place, your child could design and build a structure to hold the dirt in place.)

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SECOND GRADE

What to expect:

In second grade, children are beginning to ask bigger questions as their knowledge of the world grows. Science education plays an important role in language and literacy skill development by exposing students to words connected to classroom observations. In second grade, science education helps children come up with answers to questions like “How does land change, and what things cause it to change?” “How are materials (what something is made of) similar and different from one another, and how do their properties (color, texture, flexibility) relate to how they are used?” and “What do plants need to grow?” This information is a snapshot of learning in science for Grade 2. For a complete set of science academic standards, [click here](#) or visit sde.ok.gov/oklahoma-academic-standards.

By the end of the school year, your child will:

- Develop an understanding of what plants need to grow and how they depend on animals to move seeds from place to place and for pollination.
- Compare the variety of life in different habitats (locations).
- Develop an understanding of observable properties of materials by studying and classifying different materials. (Investigations could include ice and snow melting or frozen objects thawing.)
- Understand that wind and water can change the shape of the land and compare possible solutions that could slow or prevent such change.
- Use information and models to identify and represent shapes and kinds of landforms (plains, hills, mountains, etc.) and bodies of water.
- Use maps to locate where water is found in liquid and solid ice forms on Earth.

What to do at home:

- Grow plants in a box garden or in planters and ask your child to discuss the things that will help the plants grow.
- Go on a nature walk and write down the different plants, insects and animals you see. Then go to a different neighborhood or park and write down whether or not the same plants, insects and animals are present.
- Go on a scavenger hunt in the kitchen and ask your child to put all the bowls, utensils, pots and pans in groups based on similarities and differences.
- Notice how things change in the yard after a windy day or a strong rain. Ask your child to describe the differences and how the wind or water might have caused the change.

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Support your child's curiosity with questions like these:

- What do you notice and wonder about in your community?
- What new words or new things have you discovered?
- How can you solve the problems you see?

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Support your child's communication skills with questions like these:

- If you switched places with your teacher tomorrow, what would you teach the class? Why?
- What was the best thing that happened today? What was the worst?
- Did you learn something that challenged you today or was there something you didn't understand?

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- Connect science with engineering by asking your child what they notice and wonder about (for example, "Do you notice that dirt is carried to a new place after it rains a lot?"), then discuss what causes the things they notice, how they work or how they could be modified to work better. (For example, if you asked your child what could help keep the dirt in its place, your child could design and build a structure to hold the dirt in place.)

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THIRD GRADE

What to expect:

In third grade, children are learning about the natural and physical world around them while beginning to observe, experiment and share what they have learned. Third-graders will discover answers to questions such as, "What is typical weather in different parts of the world during different times of year?", "How are organisms like plants and animals different?", "How are plants, animals and environments of the past similar to or different from the ones of today?", "What happens to organisms when their environment changes?" and "How do pushes or pulls such as gravity or magnetism on an object affect that object?" This information is a snapshot of learning in science for Grade 3. For a complete set of science academic standards, [click here](#) or visit sde.ok.gov/oklahoma-academic-standards.

By the end of the school year, your child will:

- Organize and use data such as temperature, precipitation and wind direction to predict what kind of weather will happen in a specific place during a specific season.
- Be able to describe the similarities and differences in the life cycles of plants and animals.
- Understand inherited traits (eye color, stem length, etc.) and how living things can adapt to their environment.
- Explain how differences in characteristics among members of the same species may provide advantages in finding mates, reproducing and survival. (For example, plants with thorns may be less likely to be eaten by predators.)
- Plan and conduct investigations on the effects of forces on moving objects.
- Develop an understanding of how changes in the environment make an impact on organisms. (For example, an animal without sufficient water will be forced to move to new territory in order to survive.)
- Determine the cause and effect relationships of magnetic interactions. (For example, students will examine how the distance between objects affects the strength of the force.)

What to do at home:

- Talk about what causes a swing or seesaw to move or come to a complete stop.
- Discuss the weather forecast each day, including temperature, wind and precipitation.
- Take a nature walk and notice living things and how they are able to survive in their environment.
- Visit a zoo or farm and identify how the animals and their offspring are alike and different.
- Look for things a magnet will attract or stick to.



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Support your child's curiosity with questions like these:

- When I kick a ball, is it possible to keep it moving without stopping? Why or why not?
- What differences do you notice between the seasons in temperature, clouds, rainfall, temperature, etc.?
- What animals could live outside close to where we live? What animals couldn't? Why?

Your child will have plenty of questions. It's okay if you don't always have the answer. The best response is always, "Let's find out together."

Fostering Communication

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Support your child's communication skills with questions like these:

- What food would be served at your favorite meal?
- How did you show kindness to someone today?
- What is your favorite outdoor activity to do with family or friends? Why?

Fostering Connections

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- Connect science with writing and art by asking your child to draw pictures of the things they see in the world around them (for example, adult butterflies look different from young caterpillars, some objects are difficult to see in the dark, etc.), then add short descriptive sentences to the picture that describe the object, situation or scenario they drew and how what they know about science might be connected to it.
- Connect science with engineering by asking your child what they notice and wonder about (for example, "Do you notice that magnets interact with objects differently?"), then discuss what causes the things they notice, how they work or how they could be modified to work better. (For example, after asking your child how magnets can be used to sort recyclable items, your child could research examples of how a magnetized recycling program has been engineered to work.)

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FOURTH GRADE

What to expect:

In fourth grade, students are discovering answers to more difficult questions about the world around them. These include: “What are waves, and what do they do?”, “How can water, ice, wind and plants change the land?”, “What features of Earth can you see with maps?”, “How do internal and external parts support plants and animals?”, “What is energy, and how is it related to motion?”, “How is energy transferred?” and “How can energy be used to solve a problem?” This information is a snapshot of learning in science for Grade 4. For a complete set of science academic standards, [click here](http://sde.ok.gov/oklahoma-academic-standards) or visit sde.ok.gov/oklahoma-academic-standards.

By the end of the school year, your child will:

- Understand how fast rocks break down and how they move from place to place.
- Use data from maps to describe patterns in Earth’s features.
- Use a model to describe patterns of seismic, water and sound waves and how they can cause objects to move.
- Begin to understand how parts of plants and animals support their survival, growth, behavior and reproduction. (For example, our heart pumps blood to our bodies.)
- Develop a model to describe how an object can be seen when light reflected from its surface enters the eye.
- Be able to explain the relationship between the speed of an object and the energy of that object. (For example, the faster a ball moves, the more energy it has.)
- Understand how energy can be transferred from place to place by sound, light, heat and electric currents or from object to object when they collide.

What to do at home:

- Talk about why it might be harder to see at night or in a dark room compared to in daylight or a brightly lit room.
- Look at different plants growing outside. Discuss parts of the plants (stems, roots, flowers, etc.) that help them grow or survive.
- When you’re driving, ask your child why the windows on the side of the car facing the sun are warmer than the other car windows.
- Toss a ball outside and talk about how to make it go shorter and farther distances.

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Support your child's curiosity with questions like these:

- What kind of material would we use to build a house that could withstand an earthquake?
- What would happen if we dropped a rubber duck or other floating object into a bowl of water? Why?
- What would happen to the land if it rained nonstop for a year?

Your child will have plenty of questions. It's okay if you don't always have the answer. The best response is always, "Let's find out together."

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Support your child's communication skills with questions like these:

- What is the most exciting adventure you could take? Why?
- Who would you take on the adventure? Why?
- What was your favorite part of the day and why?
- How did you help someone today?

Fostering Connections

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SCIENCE 5

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FIFTH GRADE

What to expect:

In fifth grade, students are able to answer more advanced scientific questions. These include: “When matter changes, does its weight change?”, “How much water can be found in different places on Earth?”, “Can new substances be created by combining other substances?”, “How does matter work its way through ecosystems?”, “Where does the energy in food come from, and what is it used for?”, “How do shadows or the amount of daylight and darkness change from day to day?” and “How does the appearance of some stars change in different seasons?” This information is a snapshot of learning in science for Grade 5. For a complete set of science academic standards, [click here](https://sde.ok.gov/oklahoma-academic-standards) or visit sde.ok.gov/oklahoma-academic-standards.

By the end of the school year, your child will:

- Understand that the weight of matter remains the same when it changes form.
- Determine if mixing of two or more substances results in new substances.
- Understand how the geosphere (Earth’s surface), biosphere (living organisms), hydrosphere (water) and atmosphere interact with one another and be able to create a model showing these interactions.
- Create graphs to describe the amounts and locations of water on Earth.
- Understand that matter is made of particles too small to be seen and create a model showing this principle.
- Understand how plants get most of the materials they need to grow from air and water.
- Understand that animals’ food was once energy from the sun and create a model showing this principle.
- Recognize daily patterns of change in the length and direction of shadows, the amount of daylight and darkness, and the seasonal appearance of some stars in the night sky.

What to do at home:

- Ask your child to cook with you and discuss how, when you mix two or more substances or ingredients together, they sometimes form something new.
- Go outside on clear nights and look at the stars. Ask your child to describe patterns they see and explain how the sky looks different in summer and winter.
- Talk about how the construction of a new house or building might change the ecosystem.
- Research your town’s local recycling program or facility.

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Fostering Curiosity

Children are naturally curious and are motivated to learn about things that interest them. Since curiosity contributes to success in the classroom, it is important to encourage it at home. Play is a wonderful way to spark curiosity, so be sure to allow plenty of playtime. Encourage your child to ask questions, be creative, discover answers and explore their world.

Support your child's curiosity with questions like these:

- Do you think animals communicate? If so, how?
- What are the best things about nature?
- Does the night sky look the same every night of the year? Why or why not?

Your child will have plenty of questions. It's okay if you don't always have the answer. The best response is always, "Let's find out together."

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Support your child's communication skills with questions like these:

- What do you think we should have for breakfast tomorrow? Why?
- What goals can you set to make tomorrow better than today?
- What was your favorite part of the week and why?
- How did you help someone in need today?

Fostering Connections

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- Connect science with writing and art by asking your child to draw pictures of the things they see in the world around them (for example, shadows change sizes throughout the day, the temperature usually gets cooler after a thunderstorm, etc.), then add short descriptive sentences to the picture that describe the object, situation or scenario they drew and how what they know about science might be connected to it.
- Connect science with engineering by asking your child what they notice and wonder about (for example, "Do you notice that drinks stay colder longer in certain kinds of cups?"), then discuss what causes the things they notice, how they work or how they could be modified to work better. (For example, after asking your child about materials that keep drinks warm or cold, your child could try to design or make a container that keeps drinks cold for a long time.)

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SCIENCE 6

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SIXTH GRADE

What to expect:

In sixth grade, students will build on ideas and knowledge from earlier grades to learn about the physical sciences, life sciences, earth science and space science. With coaching from teachers, they will use core science ideas and scientific and engineering practices to understand and explain their scientific observations. This information is a snapshot of learning in science for Grade 6. For a complete set of science academic standards, [click here](#) or visit sde.ok.gov/oklahoma-academic-standards.

By the end of the school year, your child will:

- Describe changes in the motion of particles (solids, liquids or gases) when thermal (heat) energy is added or removed.
- Identify relationships among energy transfers, type of matter, mass (amount of matter) and the change in kinetic (in-motion) energy. (For example, a small icicle freezes quickly, while a large body of water does not.)
- Describe how sound and light waves are reflected, absorbed or transmitted through different materials (light waves through a prism, for example).
- Gather evidence that all living things are made of one or more cells and understand that groups of cells work together to perform tasks.
- Understand how sensory receptors respond to stimuli and transmit signals to the brain, resulting in immediate behaviors or storage as memories.
- Use patterns in data to describe past geologic processes, such as slow plate movements, landslides, volcanoes, etc.
- Analyze and interpret weather data that can be used for detecting and predicting future weather conditions caused by the motion of air masses.

What to do at home:

- Ask your child to draw how water particles may be interacting with each other in ice versus in water.
- Talk about why some cups keep drinks hotter or colder than other cups.
- Discuss why the grass turns brown during drier months and why it needs to be mowed after it has rained for several days.
- Find a puddle outside, then go back after the sun has come out and ask your child to explain what happened to the puddle.
- Ride or watch a roller coaster. Discuss why sometimes the roller coaster moves faster and other times more slowly.

YOU ARE your child's first teacher. Learn how to support the goals of Oklahoma's academic standards and why they are important to your child. Please be in regular communication with your child's teachers and ask how you can support science learning at home. When schools and families work together as partners, it helps your child achieve academic success!



OKLAHOMA
Education



SCIENCE

FOR FAMILIES

Fostering Curiosity

Children are naturally curious and are motivated to learn about things that interest them. Since curiosity contributes to success in the classroom, it is important to encourage it at home. Play is a wonderful way to nurture curiosity in young children, so be sure to allow plenty of playtime. Encourage your child to ask questions, discover answers and explore their world.

Support your child's curiosity with questions like these:

- If you could invent something that would make life easier for people, what would you invent and why?
- What kind of container would keep your coffee the hottest for the longest period of time?
- What would the world's fastest runners look like in slow motion?
- Tell me something about science you don't think I already know.

Your child will have plenty of questions. It's okay if you don't always have the answer. The best response is always, "Let's find out together."

Fostering Communication

Build your child's vocabulary, thinking skills and curiosity by using new words and having conversations that include questions to make your child think. Communicating with others gives children a chance to see and understand that there can be more than one point of view about a given subject. Accepting different ideas helps children learn how to get along with others, encouraging positive relationships with other children and a strong self-image.

Support your child's communication skills with questions like these:

- What goals can you set to help you become a better person?
- What is your favorite part of the year and why?
- How can you make a positive difference for someone today?

Fostering Connections

Making connections between different school subjects helps build your child's overall knowledge and learning. It's also important for your child to make connections between what they are learning at school and in the real world. Point out these connections to your child and encourage them to make them, too.

- Connect science with writing and art by asking your child to draw pictures of the things they see in the world around them (for example, shadows change sizes throughout the day, the temperature usually gets cooler after a thunderstorm, etc.), then add short descriptive sentences to the picture that describe the object, situation or scenario they drew and how what they know about science might be connected to it.
- Connect science with engineering by asking your child what they notice and wonder about (for example, "Do you notice that drinks stay colder longer in certain kinds of cups?"), then discuss what causes the things they notice, how they work or how they could be modified to work better. (For example, after asking your child about materials that keep drinks warm or cold, your child could try to design or make a container that keeps drinks cold for a long time.)

Join the conversation!

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