AAC Day Camp

CAMP KIT

THIS KIT INCLUDES INSTRUCTIONS FOR YOUR VERY OWN JURASSIC ADVENTURE AT HOME
Welcome to your personal Jurassic Adventure!

We are so excited to have you join us! This kit will get you started on your journey but be sure to check in online for our daily activities and live videos. Have a fun and safe adventure!

Now that you have your kit, let's get adventuring! Please check in online if you ordered the Cyber Box.
Contents:

- Shirt & Patch
- Prehistoric Amber and mineral
- Forest Forever
- Owl Pellet
- Honeycomb
- Fossil Activity
- Weather Window
- Starry Starry Day Activity
- Medicine Bag
- Compass
- Yo-Yo
- Paint
- Marbles
- Rope
- Home Depot kit
- Sundial
- Magnifying glass
- And more!

Items to gather:

- Scissors
- Clear tape
- Pencil
- Markers
- Cardboard box or poster board
- Scout manual - if you have one
Origami Bear

1. Fold the paper in half diagonally.
2. Fold the sides to the center line.
3. Fold the top corners down to the center.
4. Fold the bottom corners up to the center.
5. Fold the top layer in half to form the ears.
6. Fold the lower layer in half to form the mouth.
7. Add details to the face.
8. Finish by adding final touches.

Photo courtesy of Supercoloring.com
Origami Plane

1. Fold the paper in half diagonally.
2. Unfold and fold the paper in half vertically.
3. Fold the top corners to the center crease.
4. Fold the bottom corners to the center crease.
5. Fold the wings backward.
6. Lift the wings and form the plane.

Photo courtesy of Supercoloring.com
Origami Plane

1. Fold the paper in half vertically.
2. Fold the paper in half horizontally.
3. Fold the top left corner to the bottom right corner. Repeat on the opposite side.
4. Fold the top layer down on both sides.
5. Fold the bottom layer up on both sides.
6. Fold the top layer down on both sides again.
7. Fold the top layer up on both sides again.
8. Fold the top layer down on both sides one more time.
9. Fold the bottom layer up on both sides, then fold the top layer down on both sides.

Photo courtesy of Supercoloring.com
Origami Bookmark

How will you decorate yours?

Photo courtesy of Katokula blogspot

Send us a picture of your creation!
How to read a map

Map Key

----  =  TRAIL
X     =  TREASURE
△     =  MOUNTAINS
▲     =  FOREST
Q: How do you know if there is a dinosaur in your refrigerator? A: The door won't shut!
**Stegosaurus Trail mix**

What you’ll need:

- ½ cup Bugles (Dinosaur Claws/Nails)
- ½ cup Thin Pretzel sticks (Dinosaur Bones)
- ¼ cup Chocolate Covered Raisins (Dinosaur Poop)
- ¼ cup Jelly Beans (Dinosaur Eggs)
- 1 cup Popcorn

Ziplock bag

Put in bag and shake.
______ and ______ went on a ______ camping trip.
(Name 1) (Name 2) (Adjective)

They _______ their _______ _______ and started ___________
(Past tense verb) (Adjective) (Plural noun) (-ING verb)
______ to build a _______. They knew they needed to______
(Adverb) (Noun) (Verb)
a lot of _______ before it became too _______ so they
(Plural noun) (Adjective)
_______very _________. For a snack they decided to make
(Past tense verb) (Adverb)
_______on a _______ and cook up a can of _______. As it
(Plural noun) (Noun) (Plural noun)
got dark outside, ________ heard a ______ make a
(Name 2) (Animal 1)
sound in the woods! ________was scared and ________ a
(Name 1) (Past tense verb)
_______! Outside, ________ ________ a ________ from
(Noun) (Name 2) (Past tense verb) (Noun)
inside the tent. The ________ ________ but not before
(Animal 1) (Past tense verb)
_______over all the ________ _______! When the morning
(-ING verb) (Adjective) (Noun)
came, _______ and_______ left to go ______ up a _______
(Name 1) (Name 2) (Verb) (Adjective)
_______ and gather _______. It truly was a ______
(Noun) (Plural Noun) (Adjective)
camping trip!
Q: What should you do if you find a blue dilophosaurus? A: Try to cheer him up!
Code Word Scramble

Unscramble the words then take the circled letters and unscramble them to reveal the code below.

TOSUC

GNPIAMC

COOGINK

WIHLITTNG

SIGFINH

KPAC

CMEFIPAR

NDE

GIHNIK

Code: E - T
What does the name mean?

What does it eat?

What does it look like?
Geology:

**Geology**: the science that deals with the earth's physical structure and substance, its history, and the processes that act on it.

**Some minerals are harder than others because of how strongly their atoms are bound together at the molecular level.**

**Hardness (H)**: the resistance of a mineral to scratching. It is a property by which minerals may be described relative to a standard scale of 10 minerals known as the Mohs scale of hardness.
Color and cut out the puzzle pieces. See how many different puzzles you can solve using the websites mentioned above.

What can you create with your Tangrams?
Q: What dinosaur could jump higher than a house?
All of them. A: Houses can't jump!
AN INTRODUCTION TO FORESTS AND TREES

Imagine taking a trip to the forest... What do you see there? Do you see little animals running along the ground? Do you see birds flying high in the air or resting on a branch? Do you notice the lush, green plants surrounding you? Forests are beautiful and unique places, but they are in danger. Earth’s forests are being depleted. That means that people are cutting down trees faster than new ones are being planted. Long ago, rainforests covered 12% of the Earth’s land surface—today they cover only 2%. Recently, 10,000 square miles of the Amazon rainforest were cut down in a single year. And, forests around the world, like the one in the Congo Basin of Africa, are being threatened by loggers who cut down trees.

The 247 million acres of Earth’s lush, green forests may not be around for long—but we can help! This activity will focus on learning about and helping to save the forests. Each child will get to compare and contrast pine cones and seed pods (the “homes” of the seeds that are responsible for replenishing the forests), taste the seed of a pine tree (known as “pine nuts”), and plant his or her own pine tree to take home.

A tree is a large, green plant that makes its own food from water, light, and air. Although there are many different species of trees, all trees are made up of the same basic parts—trunk, branches, leaves, and roots. The trunk is the main, tall body of the tree. The roots go down from the trunk, into the ground where they can take water out of the soil to feed the tree. Leaves, which hang off of branches, use light to make food that nourishes the tree.

There are two main types of trees. The first are broadleaf trees like maple, oak, or apple trees. As the name suggests, broadleaf trees have large, flat leaves. The second are conifer trees, such as pine trees, have long, needle-like leaves. Trees can grow in many different places. Aside from forests, some trees grow in wet swamps, while others can grow in the dry desert. The seed you will plant today is for a pine tree (in the “Conifer” group). Conifer trees can grow in a variety of places because their leaves are protected from water loss and they can resist cold temperatures.

Trees are important for many reasons. First, trees make oxygen for people and animals to breathe. Also, we get many things from trees. Did you know that paper, nuts, fruit, and even maple syrup come from trees? Trees provide a home for many different animals—birds build their nests in the branches of trees and many insects live inside trees. Trees also help the earth... when their roots reach deep into the ground, they hold the ground in place. If there were no trees, there would be a lot of “erosion,” which is when dirt is carried away by water or wind. Trees can provide shade on a hot day. Plus, trees are beautiful to look at!

Special Note: This kit contains pine nuts for all of the participants to enjoy. Pine nuts (seeds of specific pine trees) are in the “tree nut” category (like walnuts or pecans) and could cause an allergic reaction. As with any food item, please be aware of any participants who have tree nut allergies.

In this activity, your participants will have the opportunity to plant their own pine tree seed. Before these seeds are planted, they must be soaked in water for 24 hours. Please be aware and plan ahead!
FROM SEED TO TREE:
HOW FORESTS REPLACEMENT THEMSELVES

Have you ever seen a tree with beautiful flowers or blossoms? These flowers hold seeds that the tree produces. Eventually, the flower will become detached from the tree and some of the seeds will land on the ground and begin to grow as a new tree. Cones are the “flowers” of pine trees. In fact, they are a variation on the flower and they have seeds inside as well.

Some seeds make long journeys before they begin to grow in the ground. There are many different ways that a seed can travel from the inside of a flower or cone to the place where it will grow in the ground. Some seeds (mostly smaller ones) can be carried through the air by winds—when the winds die down, the seed will land on the ground and may start growing. Other seeds land in the water and can float to a new location. Coconuts are really big seeds—they will often float along the surface of the ocean and plant themselves in the wet sand when they wash ashore. Some seeds can get stuck to the feet or bodies of animals, then begin to grow in the location of the animals when they become “un-stuck.”

What is one more way that seeds can be planted? By people! That’s what you’ll get to do soon.

The seed is the first stage of a tree’s lifecycle. A lifecycle is a series of changes that living things go through during their lives. The lifecycle of a tree is so amazing because it starts with a tiny seed and ends with a large tree. The four stages of a tree’s lifecycle are: seed, seedling, sapling, and tree.

Once a seed is planted, it germinates, or begins to grow. Every seed contains a tiny uniformed tree called an embryo, plus food that feeds the embryo. When a seed has enough heat and water, a small root called the “radicle” breaks through the outer layer of the seed called the “seed coat.”

This first root, and all others that follow, will grow downward into the ground to find water to nourish the tree. The first stem that begins to grow above ground is called the “plumule.” Small “seed leaves,” which look different than normal leaves, begin to grow from the plumule.

Once the seed grows a radicle below ground and a plumule above ground, it is called a seedling. The seed leaves contain food that gives the “baby” tree energy to continue growing. The tree’s central “trunk” grows between its seed leaves, and before long, “true leaves,” which closely resemble those of the adult tree, begin to grow from the trunk. Over the next few years, the seedling grows taller and thicker. It develops much faster in the summer than it does in the winter. When the seedling begins to look like a “mini” version of the adult tree, it is considered a sapling. A sapling’s trunk begins to turn woody like the bark of a mature tree, but it won’t be considered a mature tree for many years. Most saplings are between three and six feet tall. As a sapling, the tree’s roots grow deep into the ground. Like a seedling, the sapling grows more rapidly in the summer.

The sapling continues to grow for many years. Its branches and trunk get longer, thicker, and heavier. The roots also grow thicker and longer, but they don’t go too deep. Most roots grow sideways so they can stay in the top four or five feet of soil, which have the most nutrients. Also, a wide root base helps prevent the tree from becoming unstable and falling over. The branches of the tree begin to grow thin branches called twigs, plus a greater number of leaves.

Each year, a tree forms a new layer of bark on its trunk. If you look at the cross-section of a tree, each layer looks like a ring around the center. You can tell a tree’s age by counting its rings. As conifer trees grow, their branches grow more slowly than their trunks, so these trees appear to have a cone-like shape. Once a broadleaf tree reaches maturity, it no longer grows any taller, but its branches grow out further, causing the tree to have a rounded shape. A tree is considered to be mature, or fully grown, once it can make seeds that will produce new trees.

Like we said earlier, trees grow flowers to make seeds. The flowers of broadleaf trees are called blossoms and the flowers of conifer trees are called cones. The blossoms of broadleaf trees have two parts in their centers (stamens and ovules) that are important in making seeds. Stamens (STAY-muns) stick out from the blossom’s center and produce pollen. Ovules (O-vyoolz) are found inside the blossom and need the pollen to become seeds. Insects (like bees or butterflies) are attracted to the bright, sweet-smelling blossoms, so they fly inside, become covered in pollen from the stamens, then fly on to another blossom where the pollen rubs off on the ovules. With this pollen, the ovules turn in to seeds. Conifer trees don’t rely on insects to spread their pollen—instead, pollen from “male” conifer cones is carried by the wind and received by the ovules of the “female” cone (ovules of pine cones are on the outside of the cone). From these newly made seeds, many new trees will grow. What an amazing life cycle!
PINE CONES AND SEED PODS

Pine cones and seed pods are the "homes" of seeds. These are the places where seeds can grow, before they are brought to the ground where they will be planted. Pine cones are the flowers of conifer trees. Conifer trees, which have needle-like leaves, grow both "male" and "female" pine cones. (All of the pine cones included in this assortment are "female" cones.) "Male" pine cones are small clusters of pollen that grow close to the branch—you may not have ever noticed them. When pollen from the male cones is carried by the wind to the ovules of the female cones, seeds grow in the female cone.

Seed pods are also "homes" to seeds. Some trees with blossoms have seed pods. In addition, many other plants and flowers have seed pods. In addition to the lotus and okra pods we’ve included in this kit, other plants that have seed pods are the vanilla plant and the magnolia tree.

We’ve included a variety of pine cones and seed pods in this kit (which will vary based on availability):
- "Regular" or "normal" looking pine cones are from a variety of trees, including the slash pine, ponderosa pine, or austricala pine.
- Spruce cones look similar to "normal" cones, but are long, and have "tight" scales.
- Diadora cones are much wider than they are tall. From the top, their scales look like the petals of a flower.
- African Knob cones (from a variety of trees such as Flatseed Conebrush or Plateau Seed Conebrush) don’t have traditional scales—they have continuous circles around the outside.
- Multiflora cones (sometimes called "silvercones") are silver or gray on the outer portion of their scales.
- Sequoia cones have relatively large, diamond-shaped scales (with little space between the scales).
- Lotus pods are brown and have 15-20 holes for seeds.
- Okra pods are banana-shaped and are light brown in color.

Allow your participants to look at the different pine cones and seed pods, observe their similarities and differences, and talk about what they see. Questions for discussion:
- Which are the largest pine cones? Which are the smallest?
- How are the two seed pods different? How are they alike?
- What are some similarities and differences between the pine cones? Which ones look most alike? Most different?
- How are the scales of the pine cones different? Do any pine cones have similar scales?
- Have you ever seen pine cones that look like any of these around your home or school before?
- What common function do all pine cones and seed pods share?

EAT A PINE SEED!

Pine "nuts" are really the seeds of pine trees. Not all pine trees have edible seeds, but ones that do include the Italian Stone Pine, the Digger pine, the Ponderosa pine, the Pinyon pine, the Nut pine, and others. Pine nuts are sometimes also called "piñons" or "piñolés." These nuts usually have a thin, red-brown shell (which has already been removed). Pine nuts were an important food for many early Native Americans (including the Washo, Shoshone, Hopi, and Paiutes), especially those in the Great Basin (covering parts of Nevada, Utah, Oregon, and California), who harvested pine nuts for more than 10,000 years. Pine nuts are still harvested for food and trading. Go ahead—taste some!

HOW TO PLANT AND TAKE CARE OF YOUR OWN PINE TREE

Materials:
- Seed pots
- Soil pellets
- Pine tree seeds
- Craft sticks
- Pine Tree Information Cards
- Glue (you provide)

Directions:
1. **Note:** Before being planted, these seeds need to be soaked in water for 24 hours.
2. Begin by handing out Pine Tree Information Cards to participants. Have each participant write his or her name on the card and color it in if they wish.
3. Fold the card in half along the perforation and spread glue on the inside. Place the craft stick onto the glue so it sticks out from the bottom of the card. (About one inch of the craft stick should be resting on the glue.) Fold over the other half of the card and press it down. Set aside your Pine Tree Information Card so the glue can dry.
4. In a bowl of warm water, soak each soil pellet until it expands to be 1"-1.5" tall. Once it is expanded (after a minute or two), place it inside the seed pot with the pellet’s small opening facing up.
5. Place one seed inside the hole of the pellet. Press it down so it is 1/4"-1/2" below the top.
6. Stick your Pine Tree Information Card into the pot at the edge (between the soil pellet and the pot).
7. Follow the directions on the back of the Pine Tree Information Card for details on how to care for your pine tree. With water, sunlight, and some patience, you should be able to watch your very own pine tree grow!
**A Tree's Life Cycle**

Below are the names and descriptions of each stage of a tree's life cycle. Read about each stage, and then make your own drawing for what that stage looks like.

<table>
<thead>
<tr>
<th>SEED</th>
<th>SEEDLING</th>
</tr>
</thead>
<tbody>
<tr>
<td>When the seed leaves the flower or cone in which it grows, it is carried by the wind, water, or an animal to the place in the ground where it will be planted. Most seeds are small, and are brown, gray, or black in color. Every seed contains a small unformed tree inside. When the seed receives enough heat and water, a small root called the radicle will begin to grow. This process is called germination.</td>
<td>Once a seed germinates, it is considered a seedling. The radicle grows out of the bottom of the seed. All other roots that grow will follow the radicle down into the ground. Also, the first stem, called the plumule, begins to grow above the soil. Small seed leaves, which look different from normal leaves, grow from the plumule. Seed leaves provide food for the small seedling. Most seedlings are green, and grow up to 3 feet tall.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TREE</th>
<th>SAPLING</th>
</tr>
</thead>
<tbody>
<tr>
<td>A tree is considered to be mature once it can make seeds that will produce new trees. Although it may be hard to notice a difference in the appearance of a sapling and a mature tree, a mature tree will have flowers or cones, while a sapling will not. New seeds grow inside a tree's flowers or cones. These seeds will leave their flower or cone and begin to grow in a new location, starting the life cycle all over!</td>
<td>The main indication that a seedling has become a sapling is that it begins to look like a real tree. Seed leaves fall off and are replaced by true leaves. A sapling's trunk turns woody like the bark of a mature tree. During the sapling phase, the tree is between 3 and 6 feet tall. As a sapling, the tree's roots grow deep into the ground. The sapling grows faster in the summer than it does in the winter.</td>
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</tbody>
</table>

**How Tall Is That Tree?!?!**

Have you always wanted to know how tall a certain tree is? All you'll need is a tape measure, a friend, and a sunny day. First, measure the length of the shadow of the tree along the flat ground. Next, stand right next to the tree and have your friend measure the length of your shadow. (These first two measurements should be done at the same time of day.) Now, measure your own height. Here's the math... Start by dividing the height of the tree's shadow by the length of your shadow. Then multiply that quotient by your height. The answer is the height of the tree! Here's the equation...

\[
\text{Your Height} \times \left( \frac{\text{Length of Tree's Shadow}}{\text{Length of Your Shadow}} \right) = \text{Height of Tree}
\]
### Animal Tracks

<table>
<thead>
<tr>
<th>Animal</th>
<th>Right Front Foot</th>
<th>Right Hind Foot</th>
<th>Left Front Foot</th>
<th>Front Foot</th>
<th>Hind Foot</th>
<th>Right Front Foot</th>
<th>Hind Foot</th>
<th>Front Foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>opossum</td>
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<td>skunk</td>
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<td>raccoon</td>
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<td>red fox</td>
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<td>woodchuck</td>
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<td>cottontail rabbit</td>
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<td>gray squirrel</td>
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<td>muskrat</td>
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</table>

What tracks can you find near your house?
Vocabulary Worksheet – Wild Animals from Europe and North America

Match words and pictures

1. Armadillo
2. Badger
3. Bat
4. Bear
5. Beaver
6. Chipmunk
7. Deer
8. Fox
9. Hedgehog
10. Mole
11. Moose
12. Mountain lion
13. Porcupine
14. Raccoon
15. Skunk
16. Weasel
17. Wild boar
18. Wolf

Write the words (more than 1 answer possible)

1. Animal that climbs trees : ..........................................................
2. Smelly animal : ..................................................................
3. Animal with spines or quills : .............................................
4. Animal with antlers : ..........................................................
A Brief History of BB Guns

In ancient history, blowguns began to appear in many different parts of the world. Although crude, these primitive weapons were very accurate. They were made from bamboo or other hollowed-out woods. A blowgun is a tube into which a hunter blows to shoot a projectile out the other end. This idea was transferred into gun form somewhere in the 1500s. The bellows gun, invented around 1580, is the earliest known air-powered gun.

A few decades later, the first pneumatic (pump-up) air gun was created in France for King Henry IV. The nobility usually owned these early guns, since they were too expensive for commoners.

In the late 1700s, some units of the Austrian army were equipped with air rifles.

In America, records show that in the 1800s, Lewis and Clark had an air gun for hunting and for impressing the American Indians. The American Indians called it “the smokeless thunder stick.”

In 1885, in the United States, the Markham Air Rifle Company became one of the first companies to sell BB guns. These pneumatic rifles eliminated bullets and used a small pellet the size of a ball bearing, soon to be called a “BB.”

A few years later, a company that sold steel windmills decided to also sell BB rifles. By 1895, this company had stopped producing windmills and made air rifles full-time and changed the company name to Daisy.

Daisy's guns were mostly made of steel, which improved the gun's strength and design. The Daisy air rifle became popular very quickly, and within five years Daisy had sold 250,000 BB guns. Soon, Daisy bought out all of its competition.

Daisy also promoted to youth by making special BB guns that related with popular historical characters like Davy Crockett. In 1984, the Olympic Games featured air guns for the first time.

Today, BB guns are still being produced in both rifle and pistol forms and are very popular among all age groups.
GENERAL SHOOTING RANGE RULES

1. This range may be opened only by a qualified BSA-certified range master.

2. All commands issued by the range master must be obeyed immediately.

3. Stay behind the firing line. Do not straddle the firing line.

4. Do not pick up a gun, bow, arrow, or slingshot unless told to by the range master.

5. Absolutely no running on the range.

6. No horseplay or unnecessary talking on the range.

7. If in doubt about the rules, ask your leader or range master for advice or help.

PARTS OF A BB GUN

- Stock
- Small of stock
- Butt
- Cocking lever
- Rear sight
- Barrel
- Front sight
- Trigger
- Trigger guard
- Forearm
- Muzzle
SUGGESTED BB GUN SAFETY RULES

1. Always keep the gun pointed in a safe direction.

2. Always keep your finger off the trigger until you are ready to shoot.

3. Always keep the gun unloaded until ready to use.

4. Know how to use a gun safely.

5. Be sure the gun is safe to operate.

6. Use only the correct ammunition for the gun.

SUGGESTED BB GUN RANGE COMMANDS

LOAD.
READY ON THE FIRING LINE.
COMMENCE FIRING.
CEASE FIRING.
CLEAR ALL GUNS.

LOAD YOUR BB GUN.
ALL SHOOTERS ARE READY.
YOU MAY FIRE YOUR BB GUN.
STOP SHOOTING.
SHOW YOUR BB GUN IS EMPTY. LAY IT DOWN.
BB GUN SHOOTING POSITIONS

PRONE POSITION

SITTING POSITION

BENCHREST POSITION

FREE-ARM STANDING POSITION

IF YOU FIND A GUN

STOP!

LEAVE THE AREA!

DON'T TOUCH!

TELL AN ADULT!
A Brief History of Archery

The advancement of civilization was enhanced by the use and discovery of bows and arrows. The bow and arrow provided a much safer way to hunt and made life easier.

Generally it is thought the spear was the predecessor to the bow. Spearheads have been discovered from many thousands of years ago.

A recognizable bow was discovered dating back to 6000 B.C. that was made from yew or elm.

Egyptians, somewhere around 3500 B.C. to 2800 B.C., are considered the first to use the bow in battle, which gave them superiority over their enemies. This bow was known as a composite bow.

Assyrians developed a shorter recurve bow that provided more power and easier handling around 1500 B.C. Crossbows were also used in ancient China, but not until many years later.

Around 1200 B.C., a famous Egyptian pharaoh named Ramses II gave archery another boost by putting archers on chariots. This mobility allowed the Egyptians to defeat the Hittite army.

Through the course of history the wooden bow was made longer. The British were famous for improving on the bow, which eventually became known as the British longbow. The most famous battle of the longbow was the battle of Crécy in 1346. In 1500, crossbows were banned in England to promote the use of the longbow. In 1595, the army was ordered to replace all bows with muskets. Still, archery has remained a popular sport in England.

Around 1000 A.D., bow and arrow technology swept the Americas. As seen through archeological studies, its use was adopted by most prehistoric Native Americans.

In 1879 the National Archery Association was founded. The first national tournament was held in White Stocking Park, Chicago, Illinois, that same year. The first archery club in the U.S., the United Bowmen of Philadelphia, was founded in 1928.

In 1900, archery became an Olympic sport, but it was dropped after 1920 because the rules could not be standardized. In 1931, the Fédération Internationale de Tir à l’Arc (FITA) was founded in Paris, and it standardized the rules for international competition. Archery returned to the Olympics in 1972 and is still part of the Olympic program. USA Archery is the sanctioning body in the United States for archery events.
ARCHERY RANGE RULES

ARCHERY RANGE RULES

1. Always walk on the range.

2. Keep your arrows in your quiver until you are told to shoot.

3. Only release the bow string when an arrow is nocked and safely pointed toward the target.

4. Leave dropped arrows on the ground until instructed to retrieve them.

If there is an emergency on the range, immediately tell the instructor.

WHISTLE COMMANDS

2 WHISTLE BLASTS = Go to the line.

1 WHISTLE BLAST = Shoot.

3 WHISTLE BLASTS = Retrieve arrows.

5 OR MORE WHISTLE BLASTS = Emergency. Immediately stop shooting, return bows to the rack, and go behind the waiting line.

TYPES OF ARCHERY BOWS

RECURVE BOW

COMPOUND BOW

TIP
STRING NOTCH

UPPER LIMB
BACK

FACE

SIGHT WINDOW
ARROWPLATE
ARROW REST

HANDLE
RISER SECTION
GRIP

STRING HEIGHT

LOWER LIMB
RECURVE

IDLER WHEEL
AXLE
BUSS CABLE

LIMB BOLT
RISER
WINDOW
ARROW REST
GRIP
LIMB BOLT
LOWER LIMB
CAM

SERVING

SHOOTING STRING
CABLE GUARD SLIDE
CABLE GUARD
SERVING
GENERAL SLINGSHOT RANGE RULES

1. This range may be opened only by a certified Cub Scouts shooting sports range master.

2. All commands issued by the range master must be obeyed immediately.

3. Stay behind the firing line. Do not straddle the firing line.

4. Do not pick up a slingshot unless told to by the range master.

5. Absolutely no running on the range.

6. No horseplay or unnecessary talking on the range.

7. If in doubt about the rules, ask your leader or range master for advice or help.

SLINGSHOT SAFETY RULES

ALWAYS KEEP THE SLINGSHOT POINTED IN A SAFE DIRECTION. YOUR RANGE MASTER WILL TELL YOU WHAT DIRECTION IS SAFE. IF YOU ARE NOT SURE, ASK.

ALWAYS KEEP THE BANDS AT REST UNTIL YOU ARE READY TO SHOOT.

ALWAYS KEEP THE POUCH AMMUNITION FREE UNTIL READY TO USE.
GENERAL SLINGSHOT RANGE RULES

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PARTS OF A SLINGSHOT
Prepare for the storm!

It is a good idea to pack an emergency backpack when the weather is still nice and you are not in a hurry. Here are some things you should have packed to be ready for a storm!

- **Sturdy shoes** will protect your feet from things that may break in the storm and be sharp on the ground.

- **A sweatshirt or jacket** will keep you warm at night if you don't have a blanket.

- **It is easy to get thirsty** in a storm. Make sure you have extra water!

- **Sometimes storms last** a long time, so it is good to have extra snacks to keep your tummy happy.

- **It's okay to keep a friend** with you if you are scared.

- **You can listen to a radio** to learn about what people are doing to help you.

- **Wear a bike or football helmet** to protect your head from being hurt by things blowing in the storm.

- **If you need help**, you can blow a whistle so people can find you.

- **A flashlight** will give you light if the power goes out.

- **Band aids will cover up small cuts** if you get hurt.

- **You can use a cell phone** to call for help.

- **Pack extra batteries and a cell phone charger** to keep your radio, flashlight, and phone working.
Prepare for the storm!

Color the things you will need to pack in your emergency backpack to be ready for a storm.
Before Leaving Home... Hiking begins before you reach the trailhead. While it’s natural to want to jump into the car on a whim and drive to a favorite hiking trail, doing so is not necessarily the wisest of choices. Hiking is a lot like painting a house in that the preparation is just as important as the actual activity itself.

So before you head out, follow these tips:

• **Let people know where you’ll be hiking and when you expect to be back.** This is important whether you are going on a day hike at a nearby park or on a multi-day hike. On a backpacking trip, plan where you’ll be camping each night as well as the section of trail you’ll be hiking each day, in case you need to be pinpointed for an evacuation. The best insurance is a written reminder with all your information left behind with someone who is not going and who is expecting you back or to check in by a certain time.

• **Study your maps before you begin the trip.** Have a good idea of which route you will hike. Look for possible emergency exit points as well as places where water refills are likely. Identify more than one water spot since dry spells can be unpredictable.

• **Time control plan.** Predetermine where you ought to be at certain points of the day using your map. Factor in your walking speed based on the number of people on the hike as well as their fitness level. Also, for every 1000 feet of elevation you gain, add about an additional hour of hiking time. Remember that when traveling as a group, you are only as fast as the slowest person in the group.

• **Graph your route.** Highlight the route you will be taking. Mark potential campsites, water stops, and major road intersections.

• **Check the weather and pack accordingly,** keeping in mind that the weather at the base of a mountain and halfway up a mountain can be vastly different. Rain gear (one of the 10 Essentials) should be brought even if no rain is predicted, as wet clothes can cause a person to become hypothermic even with temperatures in the 50’s.
Zucchini Bread Pancakes

**You will need:**
- Cooking Spray
- Large Skillet
- Spatula
- Medium mixing bowl
- Small mixing bowl
- Whisk
- Oven proof pan or tray
- Foil

**Ingredients:**
- 2 large eggs
- 3 tablespoons olive oil
- 2 tablespoons light brown, dark brown or granulated sugar
- 1/4 cup buttermilk (or 2 tablespoons each of milk and plain yogurt whisked together)
- 1/2 teaspoon vanilla extract
- 2 cups shredded zucchini (from about 9 ounces whole, or 1 1/2 medium zucchini)
- 1 cup all-purpose flour (half can seamlessly be swapped with a whole wheat flour)
- 1/4 teaspoon table salt
- 1 teaspoon baking soda
- 1 teaspoon ground cinnamon
- 1/8 teaspoon ground or freshly grated nutmeg
- Butter or oil, for coating skillet
- Maple syrup

**Directions:**
In a large bowl, combine eggs, olive oil, sugar, buttermilk and vanilla until smooth.
Stir in zucchini shreds. In a smaller bowl, whisk together flour, salt, baking soda, cinnamon and nutmeg.
Stir dry ingredients into zucchini batter, mixing until just combined.
Preheat oven to 200°F and place a foil-lined pan on a middle rack.
Spray a large, heavy skillet and heat over medium heat.
Melt a Tablespoon of butter in the pan and.
Scoop scant 1/4-cup dollops of batter (mine were about 3 tablespoons each) in pan so the puddles do not touch.
Cook until bubbles appear on the surface, about 2 to 3 minutes.
Flip pancakes and cook another minute or two, until golden underneath.
Transfer pancakes to prepared pan to keep warm as well as ensure that they’re all cooked through when they’re served.
Repeat with remaining batter.
Serve warm with maple syrup.
Making a Medicine Bag

Medicine bags is where we store our meaningful possessions, our memories, our traditions. It is where we store inner strength, the inner strength we get from what is inside the bag. If we think back years ago, Native people often traveled long distance, were gone from home for long periods of time. They would need to carry inner strength in their bag to finish their journey.

Step 1: Assemble your medicine bag

Step 2: Gather your items for your medicine bag

Medicine pouches would carry herbs and/or medicine (sage, cedar, sweetgrass) that the carrier would use to connect with God and mother nature. The bag could also include personal possessions such as belongings of family members or special mementos. You can put whatever you feel like putting in your bag. It is your personal bag. items placed within should be seen as sacred or symbolic of something sacred.

Examples of what you can add to your medicine bag:
Feathers, stones, plants, shells, herbs, paper, coins, Protection stones such as Pipestone, Natural stone, Black stone, Rose Quartz, Amethyst, Crystal Quartz, Pyrite, etc...

You can also use your medicine bag as a first aid pouch!

Q: What do you do when a dinosaur sneezes?
A: Get out of the way!!
Building a First Aid kit

**MATERIALS:**
- Container such as a soap dish, Altoid tin or glasses case
- Red duct tape and/or Sharpie
- Adhesive bandages
- Butterfly bandages
- Individual packages of antibacterial cream or travel size tube
- Non-latex gloves
- Gauze pads
- Medical tape
- Individually packaged antibacterial wipes
- Moleskin
- Safety pins
- Alcohol Wipes
- Pain Relievers
- Printable first aid cards provided

**INSTRUCTIONS:**
Pick out your container. While there are many options, here are the ones I picked for this post: Altoid tin, travel soap dish, soft-sided eyeglasses case. Tear or cut two small strips of the red duct tape, and apply to your container to make a cross. Write "First Aid" on the tape with the Sharpie. For the eyeglasses case, you might just want to write "First Aid" directly onto the case with the Sharpie. Start by placing the gloves on top of each other. Fold them several times until they're small enough to fit into your container. Tear off a long strip of the medical tape. Wind it around the gloves. Place the hurry cases cards at the bottom of the container. Next, place the gloves on top of the cards. Continue putting each of the items into the container.
WHAT IS FIRST AID?
First aid is emergency care given immediately to an injured person. The purpose of first aid is to minimize injury and future disability.

WHAT ARE HURRY FIRST AID CASES?
We all know that things like minor cuts and scratches, blisters on our feet, and sprained ankles need to be treated, but they aren't life-threatening. But some medical conditions are. For these, a person could quickly die if not treated properly right away. We call these the “hurry cases.” They are:

- Serious Bleeding
- Heart Attack or Sudden Cardiac Arrest
- Stopped Breathing
- Stroke
- Poisoning

First of all, they need to remember the Three Cs.

THE THREE CS FOR HURRY FIRST AID CASES:

CHECK: Make sure the area is safe for YOU. If you get hurt, you won't be much help to the person in trouble. Next, check the victim to find out what's wrong. Are they breathing? Are they moving? Tap the victim's arm and ask if they're OK. Can they respond?

CALL: Call 911. If there are people around, you can call out for help. If there aren't many people around and no one has access to a phone, send someone to get help.

CARE: Take care of the victim to the best of your ability until help arrives. Some of the ways we treat emergency situations require special training, but there are things you can do as you wait for help to arrive.

We won't go into detail about how to respond to each of the hurry cases. Your Scouts can find more information in the First Responder section of their handbooks.
### Serious Bleeding Hurry Case
- Blood gushing out of a wound like a fountain needs immediate attention.
- Put on gloves and eye protection before touching victim.
- Grab wound and press hard.
- Grab cloth, fold it, and press on wound. Don’t remove pad if it gets soaked with blood. Instead, put another one over the first.

### Heart Attack/Cardiac Arrest Hurry Case
- If person is unresponsive, begin chest compressions immediately.
- Put your hands on top of each other, and lace fingers together.
- Using heels of your hands, push hard and fast on victim's chest for 30 compressions.
- Perform 2 rescue breaths.
- Give 30 compressions. Continue this cycle.

### Stopped Breathing Hurry Case
- Make sure victim is lying on their back. Press down on forehead & lift chin to open airway.
- If victim isn't breathing, give 2 rescue breaths. Put CPR barrier over mouth.
- Pinch victim’s nose, seal your mouth over theirs, and blow into it to fill lungs.
- Remove mouth, then give another rescue breath.

### Stroke Hurry Case
- Remember **FAST**.
  - Face drooping - One side drooping? Uneven smile?
  - Arm weakness - One arm weak or numb?
  - Speech difficulty - Slurred speech? Hard time speaking or repeating simple sentence?
  - Time to call 911 – Call 911 immediately for any of these signs.

### Poisoning Hurry Case
- If someone has swallowed or breathed in poison, call 911 or 1-800-222-1222 (national Poison Help Line) immediately
- Tell operator what the poison is, if you know it. Follow their directions.
  - Save poison container so professionals can identify poison.

### 3Cs for Hurry Cases
**CHECK:** Make sure area is safe for you. Is victim moving or breathing? Responding questions?
**CALL:** Call 911. Call out or send someone for help.
**CARE:** Care for victim as best you can while waiting for help. Perform first aid for hurry cases.
Emergencies can strike quickly and without warning. When emergencies occur, you can take important steps that will save lives and protect your family.

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**Know your number!**
Ask a grown-up to help you write your phone number on the line. Then use your finger to practice pressing the numbers. You can also practice dialing 9-1-1 to get help.

**Where to Meet**
Paste a photo or draw a picture of your family’s meeting place in the space below.

My Phone Number

My Family’s Meeting Place
Your parents will tell you what to do if there's an emergency. And if you're not with your parents, there are other grown-ups who can help you, like police officers, firefighters and teachers.

Use a crayon or finger to find the helpers in your neighborhood.
Disaster Dan brings home an interesting homework assignment.

My homework is to review our family emergency plan and our preparedness supplies. Do we have those?

We asked Grandpa to be our out-of-town contact.

What a great idea! Let's go over them.

That way we can call grandpa and he can tell everyone we are safe.

Yeah, let's update all of our emergency contacts and make sure we have a family meeting place in an emergency.

The next step is to check our emergency supplies to make sure we have everything we need for us and Dana.

Great, I will go around the house now and make sure we are prepared!
Find things you will need to have on hand to help you and your family be prepared for an emergency.

Find and circle these items in the house:

- Flashlight
- Radio
- Clothing
- Blankets
- First aid kit
- Dog food
- Water bottle
- Contact list
- Sturdy shoes or boots
Disaster Dan made his emergency kit, now you can too! Look at this list of items to put in your disaster supply kit. Remember, during a disaster, you may have to evacuate quickly and there might not be enough time to gather all the supplies you need, so start preparing today!

- Canned or dried foods
- Can opener
- Water (one gallon per person each day)
- Flashlight
- Radio
- Extra batteries for the flashlight and radio
- Things to play with like games, cards, or crayons
- Soap, toilet paper, toothbrush
- Extra clothing and blankets
- Eye glasses and medicine
- First aid kit
- Contact list
- Forks, spoons, knives, and paper plates
- Copies of IDs and credit cards
- Cash and coins
- Whistle
- A map of the area
- Sturdy shoes or boots
- Baby food, bottles, diapers

Don't forget your family pet!

Disaster Dan wants you to think about your pet in your disaster plan, too. If a disaster strikes, take your pets with you. If you have to evacuate, circle the pet items that you will want to take with you.
ACROSS
2  Something to keep you warm.
3  A furry family friend at home.
7  What you enjoy eating between lunch and dinner; what you should have in your emergency kit.
8  You can listen to music on it and it will provide good information during a disaster.
9  When the ground shakes!

DOWN
1  Helps you see in the dark.
3  Your family should have a disaster ______ in case of emergency.
4  You should know your parent’s ______ number.
5  We all need a gallon per day for drinking and cleaning.
6  A Japanese word for a powerful rising of the ocean.
Don’t Delay! Prepare Today!

This activity guide is a fun way to prepare kids and families for disasters. The activities in this guide are intended to teach children how to prepare for emergencies and discuss preparedness with their families. This guide is based on a simple, three step message – get a kit, have a plan, sign up and be informed. By following these steps, families can get prepared in a fun and easy way!

**STEP 1**
Get a kit!

Be sure to have seven days of emergency supplies.

**STEP 2**
Have a plan!

Be sure to have an emergency plan and a way to contact your family.

**STEP 3**
Sign up and be informed!

Sign up for your city’s alert notification system or stay informed by radio or by computer.
Building a Better World

What did you learn about scouting in another country?

What country did you choose?

What rank would you be in this country?

What would your uniform look like?

What is their Scout Oath and Law? Is it the same as ours?
Careers in Construction

There are many, many careers in construction. Below are just a few careers. Take some time to read about one of these jobs and draw a picture of what they might do during their workday.

- Construction Project Managers
- Plumbers
- Electricians
- Civil Engineers
- Solar Photovoltaic Installers
- Wind Turbine Technicians
- Sheet Metal Workers
- Glaziers
- Masonry Workers
- Ironworkers
- Elevator Installers and Repairers

Q: What does a triceratops sit on? A: Its tricera-bottom!
**Square (Reef) Knot Instructions**

1. Cross the blue and red ends
2. Pass the red end through the blue loop
3. Pull the ends to tighten
4. The knot is complete

**Overhand Knot Instructions**

1. Form a loop by passing the tag end over the standing part
2. Tuck it inside the loop and pull it out completely
3. Pull both ends to tighten

**Bowline Knot Directions**

1. Pass the tag end through the rope loop
2. Pass it behind the standing part and through the loop again
3. Hold the loop and tag end and pull to tighten
4. The knot is made
**Taut Line Hitch Instructions**

1. Loop around the support and wrap the end around the standing part
2. Wrap it once more and bring it out of the loop
3. Wrap it again
4. Hold and pull to tighten
5. Slide to adjust the tension

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**Tying Two Half Hitches**

1. Wrap the rope around a support
2. Pass the end through the loop
3. Wrap it around the standing part
4. Tighten to complete
AN INTRODUCTION TO HONEY BEES

More than 25,000 species of bees have been identified around the world, with approximately 3,500 species found within the continental United States. Of all of these species, only eight to ten of them are represented by bees known today as “honey bees.” The most common kind of honey bee found today in the United States is called *Apis mellifera*.

Honey bees are insects. All insects have six legs, three body sections, and antennae. Honey bees are hairy insects that are brownish-orange and black. They feed on pollen and nectar. Most honey bees have pollen baskets in their legs for carrying pollen. Honey bees are social insects, which means that they don’t live alone. Instead, they live in groups—we will find out soon just how big those groups are!

Like most insects, honey bees go through four stages of development: egg, larva, pupa, and adult. To begin life inside the hive, the queen bee inserts her abdomen into a honeycomb cell and lays a soft, white egg about the size of the dot over an “I.” After three days, a small wormlike larva hatches from the egg. The larva grows larger as worker bees feed it bee bread (a mixture of nectar and pollen) and royal jelly (a milky, yellow syrup that is high in protein). The new bee will become one of three types of honey bees depending upon the quantity of bee bread and royal jelly they receive. On the tenth day, the larva spins a cocoon around itself while still inside the cell. While inside the cocoon, the bee begins to look more like an insect than a worm as it develops eyes, legs, and wings. Finally, an adult bee chews itself out of the cell after a period of time (16 days for a queen, 21 days for a worker, and 24 days for a drone). Honey bees are social insects and live in groups called colonies. In each colony, there are three castes (or types) of bees: the queen, the worker bees, and the drones.

- The queen is the largest of the bees and is in charge of the hive. There can be only one queen per hive. She has a stinger, which she uses to fend off other queens and she may sting multiple times without dying.

- Worker bees are females and the smallest bees, but they make up 99% of the population in the colony. One of the major features of the worker is her long proboscis (PRO-bah-sis; similar to a tongue), which is used to suck nectar from flowers. Worker bees have many daily tasks including tending to the young, gathering and storing pollen and nectar, producing wax, caring for the queen and drones, and making honey, royal jelly, and bee bread. No wonder they’re called “worker” bees! Generally, worker bees can only sting once because their internal organs are pulled out with the stinger so they will die.

- Male bees in the colony are called drones. They are a bit larger than worker bees and have a rounded abdomen, large eyes, and powerful wings, but no proboscis. Drones have no protection because they don’t have stingers. In fact, their only purpose is to mate with the queen (a process that takes place in the air).

Each colony can have as many as 60,000 bees! You are about to learn about two of the magnificent creations of honey bees… honeycomb (the wax substance that is made up of thousands of perfect hexagons) and honey (the sweet substance that bees create inside their hives).
WHERE DO WAX AND HONEY COME FROM?

Worker bees have two very important jobs in addition to the tasks of cleaning the hive and feeding larvae. These jobs are: producing wax like each child will see when they receive their very own piece of beeswax, and honey like they will get to taste...yum!

WAX

The inside of a hive contains wax produced by the worker bees. The wax is secreted from small flakes on the underside of the abdomen. Bees chew on the wax so it will be soft and pliable. The wax is formed into one or more large sheets called “wax combs.” Each comb is made up of six-sided wax structures known as “cells.” Thousands of hexagon-shaped cells make up each comb and are used to store honey and pollen. They are also used as nurseries for developing bees. Before each participant makes a candle, allow him or her to look at a piece of the honeycomb. What does it feel like? What does it smell like? Where might the honeycomb’s color come from? Can you bend it easily? How many cells are in each wax square? How many cells do you think there must be in a whole hive? As your participants make their honeycomb candles, let them notice the many interesting features of this amazing wax.

HONEY

Honey is a sweet and sticky substance produced by honey bees. The process starts when worker bees collect nectar (a sweet fluid produced by flowers) and store it in a pouch on their body called the “honey sac” while they fly back to the hive. Once they return, they pass the nectar to other worker bees in the hive. The bees then mix the nectar with special enzymes (proteins which help chemical reactions occur) and leave the mixture to sit in open cells of the honeycomb to allow some of the water to evaporate. The worker bees assist the evaporation by fanning the cells with their wings. Once all of the water is gone, honey remains. The worker bees then seal the honey inside the cells of honeycomb using beeswax (a substance stored in glands on the underside of the abdomen). Even though there are many bees, honey-making is a slow process... it takes the nectar of about 2 million flowers to make 1 pound of honey.

A TASTE OF HONEY

Here are some additional interesting facts about honey to share.

- Honey is the only food consumed by humans that is produced by insects.
- There are more than 300 types of honey available in the United States. They are different because each is produced from the nectar of a different flower.
- On average, honey is about 17% water.
- Honey is sweeter than sugar.
- As noted above, the nectar of about two million flowers is required to make one pound of honey. This involves a total flight of over 55,000 miles by thousands of bees, because each adult bee is only capable of making about 1/12 of a teaspoon of honey during her entire life. A single bee will visit 50 to 100 flowers to gather nectar on each trip before returning to the hive.
- Honey bees produce honey primarily as food for themselves and their hive. Species such as *Apis mellifera* (North American honey bees) produce far more honey than they can consume, so there is plenty for humans to harvest!
- Honey has long been enjoyed not only for its sweetness, but also for its healing powers.
- The color and flavor of honey vary depending on the source of the nectar. The color of honey can range from almost clear to dark brown and the flavor can range from mild to very bold. In general, lighter colored honeys have milder flavors, and vice versa.
- Honey comes in a variety of forms including liquid, whipped and comb honey. Liquid is free of visible crystals, while whipped honey is very finely crystallized. Comb honey is still contained in the cells of the beeswax comb in which it was produced.

Enough talking about honey... go ahead, have them try some! Each person can try honey from their own enclosed honey sticks. Before eating the honey, you may want to use it for the “Pheromones” activity (#2) listed in the “Additional Activities” section. The type of honey contained in these sticks is Clover honey, which has a pleasing, mild taste. Depending on the location and type of clover, the color of clover honey can vary from clear to a light amber color. Other types of honey include Alfalfa honey, Basswood honey, Buckwheat Honey, Orange Blossom honey, Tupelo honey, and Wildflower honey. Encourage children to look for them at the grocery store. They can also look for products that contain honey as an ingredient.
HOW TO MAKE YOUR OWN HONEYCOMB CANDLE

Materials:
- Square of Honeycomb
- Piece of wick
- Masking tape and pen to label candles (not included)

Directions:
1. Lay out the Honeycomb square on a flat surface covered in a smooth material, like wax paper.
2. Place the wick along one edge of the Honeycomb, and press it down into the edge.
3. Slowly roll up the Honeycomb around the wick. Make sure that the wick is carefully tucked inside.
4. Once the candle is fully rolled, press the exposed edge of the Honeycomb into the rest of the roll so that it sticks together.
5. Tuck in the exposed edges at the bottom of the candle to hide any wick that might still be showing.
6. Wrap a small piece of masking tape around the exposed end of the wick and write each child's name on his or her candle.

NOTE: The honeycomb included in this kit is somewhat temperature sensitive and should be stored at room temperature. When you receive this Activity Kit, you may want to let the honeycomb sit out to return to room temperature. If the honeycomb feels brittle or inflexible, you can heat it with a slightly warm hairdryer.

ADDITIONAL HONEY BEE ACTIVITIES

1. Review & Extended Learning Questions. Name three distinct features of each caste of honey bee. Why can't drones gather their own food? Why can't drones defend the colony? What might happen to the colony if there was no queen? What would happen if there were no drones? What are two common features of all insects? What other insects look like honey bees? List four duties of the worker bees. What things do your parents do for you that are similar to what worker bees do for the other bees?

2. Here's an activity to try with your honey sticks. Students will learn how pheromones (FEHR-uh-mones) allow bees to communicate. Materials: Small jars with different scents inside (vanilla, lemon, etc.), honey sticks, blindfolds. Discussion: Like humans have noses that we use to smell, honey bees use their antennae to detect the “scent” of pheromones. A variety of pheromone scents can be emitted. These include the alarm scent calling for defense of the colony or the scent a queen emits to attract drones to mate. As a group, decide what different smells will mean and have students take notes. For example, the smell of cinnamon could mean “Turn Right” or basil could mean “Go Backwards.” Procedure: Construct a maze in your location (use chairs, desks, or whatever you have available). Break participants up into pairs or small groups. Hide some honey sticks around the room. Once one person from each group is blindfolded, let others who are not blindfolded use the scents in each jar to direct the blindfolded “bee” to the honey. (Let other team members guide the “bee” for safety, but be sure there is no talking!) Afterwards, talk about how it was different to use only the sense of smell to find something without using their eyes and only through smell. Enjoy your honey!

3. Why does a honey bee die when it stings a mammal? Gather together a few materials for this interesting activity: oranges, straight pins, and barbed fish hooks (Caution—Sharp!). Discussion: How do different animals defend themselves? Snakes? Bears? Have you ever been stung by a bee? What were you doing at the time? Why do you think bees sting people? Facts: Honey bee stingers are flexible and barbed (they appear very jagged). When a honey bee stings a person, the barbs prevent the bee from pulling the stinger out of the person. When the stinger is pulled off its body, some of the bee’s organs can be damaged. Procedure: Explain that the orange represents the flesh of a mammal and the barbed fish hook is like a honey bee’s stinger. Have the students stick the straight pin into the orange and pull it out. Was there any resistance? Now, do the same with the fish hook. Was there more resistance? Why?

4. Try out this yummy honey recipe! Make Honey Banana Pops (enough for 8 people). Ingredients: 4 peeled bananas, 1/2 cup honey, 1-1/3 cups topping (such as graham cracker crumbs, sprinkles, crushed nuts, toasted coconut, etc.), 8 wooden craft sticks. Directions: Spread the toppings of your choice out on plates. Peel and cut bananas in half (so you have two separate ends of the banana). After inserting the wooden stick into one end of the banana, hold the banana over a plate as you spread about one tablespoon of honey over the banana. Roll the banana in the topping(s) of your choice. Place pops down over wax paper or eat them right away!

Answers for Honey Bee Identification on Back of Instructor’s Manual:
Left = Drone; Center = Queen; Right = Worker
Answers for additional facts are from information provided on front of manual.

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**Word Search**

Use the word bank at the right to find the honey bee terms in the puzzle below. Words go horizontally, vertically and diagonally, but not backwards.

- Abdomen
- Antennae
- Beeswax
- Cell
- Clover
- Colony
- Comb honey
- Drone
- Hexagon
- Hive
- Honeycomb
- Honey sac
- Liquid honey
- Nectar
- Pheromone
- Pollen
- Queen
- Stinger
- Whipped honey
- Wings
- Workers

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**Which Type of Honey Bee is This?**

See if you can name the type of honey bee in each picture using the given clue. Then, list two more facts about each type of honey bee.

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**You Might BEE Interested in These Fun Facts...**

- Honey bees’ wings stroke 11,400 times per minute! This causes the “buzz” that bees are known for.
- It would take about one ounce (two tablespoons) of honey to provide enough energy for a honey bee to fly around the world (if the bee could live that long!).
- Adult worker bees have a lifespan of about 45 days during summer months.
- When a bee enters a flower to drink the nectar, the bee gets covered in pollen, which is collected in the pollen baskets in the legs. When the bee moves on to another flower, some of the pollen from the first flower rubs off on the second flower. This process is called pollination. Once pollinated, the plant will drop its flower and make a fruit with seeds in it. The seeds may grow into a new plant. This truly amazing cycle shows that the bees cannot live without the plants and the plants cannot live without the bees.
- A honey bee can fly about 13 miles per hour.
Imagine a time before clocks... What would it be like without those two important hands of the clock telling you what time it is? What would you do if you couldn't simply look at the digital watch on your wrist? There weren't always clocks, so how did people tell time before the clock was invented? Some people would wake up in the morning when the rooster on their farm "cock-a-doodle-doo"-ed. In some societies, people would know the time of day based on the ringing of a bell or sounding of a horn. Maybe some people could tell the time of day by when they got hungry (don't you get hungry right around lunch in the middle of the day or dinner at the end of the day?). Eventually, some people in ancient civilizations realized that they could tell what time of day it was by looking at the sun's position in the sky.

Who were these people? The first sundial was believed to have been made by the Egyptians around 1500 B.C. (That's about 3,500 years ago!) Scientists have found evidence of sundials in many ancient civilizations including those of the Babylonians, Egyptians, Greeks, and Romans. In ancient times, sundials were a symbol of status-rich members of society would build big sundials in public with their names on them, in order to show their prestige.

Though sundials have been constructed in many forms, they all do the same thing; they tell time by casting a shadow. Some sundials cast a shadow onto a flat circle called a "dial," while others cast a shadow on a vertical ("up-and-down") surface. The raised part of the sundial that casts the shadow is called the gnomon (pronounced NO-mon). The gnomon projects a shadow that indicates the time based on lines or curves marked on the surface. These lines are labeled to correspond to hours. Sundials are not precise, but people in many civilizations used them to tell time until the invention of the first mechanical clock (called the "weight-driven clock," first made in the 13th century in England).

Today, because modern clocks are almost always accurate, easy to use and work even when the sun isn't shining, sundials are mostly used for decoration. With this activity kit, you will make your own portable sundials and be able to tell time without a clock!
HOW SUNDIALS WORK

Have you ever heard the saying that “the sun rises in the east and sets in the west”? As the earth rotates on its axis each day, the sun appears to move across the sky. Remember that in relative terms, the sun is actually standing still, but the earth is spinning and makes one full rotation every 24 hours. During the day, as we spin, shadows created by the sun move across the ground. They move in the same direction every day and at the same speed. This is why we can make a sundial that can help tell us the time. (On a side note, the hands of a clock rotate in the direction that they do because they mimic the movement of the shadows cast by the sun throughout the day...hence the term “clockwise”)

Sundials get a little tricky because of the tilt of the earth and the 365 day revolution that it makes around the sun. To best explain how a sundial works, for the moment let’s assume that the earth is not tilted. Were this the case, at any location on earth, the sun would rise and set at the same time each day. Now, if you had a fixed object (say a flag pole) it would cast the same shadow at the same time everyday. If you marked on the ground where the shadow ended one hour after sunrise and then each hour after that until sundown, you would create a sundial. You could then make a chart to indicate what happens during the day when the shadow reaches each mark. Examples might be that breakfast is eaten when the shadow reaches the 2nd mark, lunch when it reaches the 6th mark and dinner when it reaches the 11th mark. In this way, the shadows would be providing the time. The same concept would apply with a sundial of the type that you will make with this activity.

What makes this a little harder is that the earth is tipped on its axis and because of that the sun is higher or lower in the sky depending on the season and therefore the shadows it casts change with the seasons. The good news is that there is a specific pattern to this that is predictable and therefore, a sundial can be made to account for the changing seasons (even daylight savings time). Using the flagpole example, the seasonal adjustment is made by creating a “zone” or area into which the shadow will fall depending on the season. If the shadow stretches 15 feet at noon during the middle of June and 25 feet at noon during the middle of December, then this is the zone for the noon hour depending on the time of the year. The higher the sun in the sky, the shorter the shadow. The lower the sun, the longer the shadow.

On the graph that you’ll be wrapping around your own Pocket Sundial, we’ve made sections for each month that will account for the Earth’s current position and there is a zone for each time range. The other factor that affects your sundial is where you are on the Earth’s surface, specifically, your latitude (your distance from the equator). You can’t take a sundial that is calibrated for the equator and use it 2000 miles to the north without re-calibrating it for that latitude. When you begin putting together your own Pocket Sundial, you’ll adjust one screw in the side to account for your latitude.

The tilt of the Earth and the fact that we are making a portable sundial make creating an accurate sundial fairly difficult, but not impossible. First, let’s talk about two main kinds of sundials...

The first type of sundial is the Azimuth Sundial (pronounced AZ-uh-muth). Azimuth is a way of measuring horizontal position on the horizon (the horizon is the point where the land meets the sky, visually). Azimuth sundials use the sun’s horizontal position to indicate the time. Usually these sundials need to have their gnomon pointing north.

The second main type of sundial—the kind you will be building today—is the Altitude Sundial (also called the Elevation Sundial). Altitude is the vertical position of the sun over the observer’s horizon. In other words, altitude measures how high or low the sun is in the sky. Altitude sundials use the height of the sun to tell time, and usually do not have to have their gnomon pointed north (our flagpole is a good example). In your sundial, the wooden dowel that makes up the main portion will be vertical (perpendicular to the ground), so the gnomon “screw eye” will be horizontal (parallel to the ground). As the sun strikes the gnomon, the sun will cast a long shadow when it’s high in the sky (around noon each day) and a short shadow when it’s low (in the morning and evening). (See the picture below for an illustration of altitude, azimuth, and the horizon.)
Name: ____________________

How to Use Your Pocket Sundial

Use these directions to “set up” your sundial the first time you use it and to tell the time with it. You can fold this page up and keep it in your pocket. Also, be sure to familiarize yourself with the “Time Terms” at the bottom of the page!

1. The sun must be shining for your sundial to work. Before you use your pocket sundial for the first time, you will need to adjust for your location on earth. Follow these steps:
   - Stand with your back squarely to the sun.
   - Hold the dial (by the string) out in front of you with the side screw facing directly towards you. (Don’t let your arm block the sun.)
   - At this point, sun should be striking the top of the side screw (your gnomon) and creating a shadow that is being cast down onto the colored piece of paper.
   - Turn the graph so that the correct month is directly below the “gnomon.”
   - Read the time on your graph. Check the time on a clock or watch that you know is accurate. Unless you got very lucky, these won’t match yet.
   - Now, turn the “gnomon” screw until the tip of its shadow falls at the current time. If the shadow does not extend far enough down the graph, turn the screw to the counterclockwise. If the shadow extends too far, turn the screw to the clockwise. Continue adjusting until the shadow end is in the correct location for the current time. Note that the “gnomon” screw eye’s head should end up being horizontal (as shown in the picture), so you may have to rotate it slightly once you’ve found its exact place.

2. To tell the time with your pocket sundial...
   - As months pass, turn the graph on the dowel until the current month is directly below the “gnomon” screw eye.
   - Stand with your back to the sun. Hold your sundial by the string and slowly turn your sundial until the shadow from the “gnomon” is pointing directly downward.
   - The shadow of the edge of the “gnomon” screw eye will indicate the time. As you can see by looking at the lines on the graph, each line (except the lowest one) corresponds to two times. You must decide whether it is morning or afternoon.

3. If you initially put together your sundial for daylight savings time and you have switched back to standard time, simply subtract one hour from every reading. (The DST graph will be one hour “fast” during standard time.)

4. You may have to “re-calibrate” your sundial if your location changes significantly from your initial location. To do so, follow the steps in section #1.

Time Terms

Horology (ho-ROL-uh-gee) is the science of timekeeping. There are many different terms that are used to describe different measurements of time—we use some every day like “minutes,” “hours,” or “days,” but there are others that you probably use but don’t think of as part of telling time. They include:

- **Year**: a period of 366 days that it takes for Earth to make one complete trip around the sun; the year begins on January 1st
- **Month**: one of the 12 divisions of the year; probably based approximately on the length of one moon cycle (from new moon to new moon)
- **Week**: seven days in a row; a week begins on Sunday and ends at midnight on the following Saturday
- **Day**: the time the Earth takes to make one complete turn on its axis; a period of 24 hours beginning at midnight
- **Hour**: one of the 24 divisions of a day
- **Minute**: one of the 60 divisions of an hour
- **Second**: one of the 60 divisions of a minute
- **Leap Year**: a year that contains 366 days, one extra day (February 29)
- **Time Zone**: a geographical region within which the same standard time is used; time zones divide the earth into 24 "slices" so that the sun will be at its highest point in the sky at noon every day in each zone. (The exact time at which the sun hits its highest point each day changes slightly depending on one’s position within their time zone)
- **A.M. and P.M.**: A.M. means “ante meridiem” (ante-mer-i-dum), before midday, and P.M. means “post meridiem,” after midday; these words were created by the Romans

What is Daylight Savings Time? Have you ever heard the saying “spring forward, fall back”? In order to have daylight hours coincide with the time when most people are awake, the United States Congress decided that daylight savings time would “jump forward” an hour on the second Sunday in March and “jump backward” one hour on the first Sunday in November. During daylight savings time, the sun rises and sets one hour later than it would under Standard Time. During Daylight Savings Time, we basically “shift” each day’s sunlight one hour later. (If we didn’t, it would get sunny very early because the sun spends so much time in the sky during the long summer months during daylight savings.)

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HOW TO MAKE YOUR OWN POCKET SUNDIAL

Materials:
- 4" long wooden dowel
- 2 screw eyes
- Sundial Graph card
- String
- Rubberband
- Scissors, markers, clear tape (you provide)

Directions:
1. To begin this project, you must know whether you are currently observing daylight savings time (most states observe daylight savings time from the second Sunday in March through the first Sunday in November). Color in the hour lines on the correct side (ST or DST) of the Sundial Graph card. Color lightly so that the times are still visible. Then, cut out the sundial graph along the dotted lines on the side that you colored.
2. Screw one screw eye into the pre-drilled hole at the top of the dowel so it is about 1/2 - 1/2" deep. (Just far enough so it won't pull out.) This is the "hanging" screw eye.
3. The second screw eye is your sundial's gnomon. Screw this screw eye into the pre-drilled hole along the side of the dowel. (You will learn how far to turn it to adjust for your latitude in the "How To Use Your Pocket Sundial" section on the next page.)
4. Wrap the sundial graph around the dowel and tape one end over the other where it says "Tape edge over here." Ensure that the colored side is facing out and the month names are at the bottom (away from the screws). Don't tape the graph onto the dowel. The graph should be just loose enough to be able to move and rotate around the dowel.
5. Slide the graph up so its top edge touches the screw eye on the side.
6. Wrap a rubber band around the bottom of the dowel (just below the graph card) so the sundial graph cannot slip off the bottom. Don't put the rubber band on the paper.
7. Tie a piece of string through the "hanging" screw eye so you can hang the sundial or wear it around your neck.

ADDITIONAL ACTIVITIES

1. Review and Extended Learning Questions. We know that because the earth's axis is tilted and because the earth rotates around the sun, the sun appears in the sky for different amounts of time each day in the year. During what part of the year is the sun in the sky for the most time each day? When is there the least sun each day? Do you think this has anything to do with the seasons? (Do additional research to find out why.) There are four time zones in the (continental) United States. Can you name them all? Which one are you in? Talk about the sun's altitude and azimuth on a sunny day. Start with the altitude—does the sun have a high altitude? (This would mean it's high in the sky, far away from the horizon, like in the middle of the day.) Or does it have a low altitude? (This would mean it's close to the horizon, like in the morning or evening.) Now, the sun's azimuth... Is it close to the east (in the morning) or close to the west (in the late afternoon)? (You can figure this out by using a compass or through the "Get oriented!" activity below.)

2. Get oriented! Stand outside during the day and figure out where north, south, east and west are. It's pretty easy (you just have to know where in the sky the sun rose). Stand facing the direction in the sky where the sun rose—that's east. Directly behind you is west. Now, while still standing facing the east, point to your left—that's north. And to your right is south. This works anywhere. You just have to know where the sun came up.

3. Time Trivia. Do additional research on the internet or in the library on what other tools were used to tell time before the clock came about. There were some pretty neat ones.

4. Time to Practice Math. We learned in the "Time Terms" section about the many different units involved in measuring time (days, hours, minutes, etc.). Try out some math problems using this information. They can be simple ("If there are 24 hours in one day, how many hours are in two days?") or a bit more complicated ("How many seconds are there in a week?").

5. Design your own sundial. As you've seen, sundials can come in many different shapes and sizes. They can stand up and have a horizontal gnomon, or they can be flat with a vertical gnomon. Design a sundial yourself. What shape would it be? Would you paint or color it? How and where would the shadow be cast? When you're done, compare it with your friends!
HOW TO POLISH YOUR PREHISTORIC AMBER

Materials:
- Pieces of unpolished Amber
- Sandpaper
- Emery Boards
- Squares of Denim
- Toothpaste and Toothbrush
- Furniture polish, car polish, etc. (Optional)

Directions:
1. Let each child begin by sanding the larger surfaces of the amber with the sandpaper and the smaller crevices with the emery boards. The participants can switch off between the two materials, or they can fold the sandpaper to fit into smaller crevices. The emery boards have a finer grain than the sandpaper. A very smooth surface can take up to 15 or 20 minutes of polishing with the sandpaper and emery boards.
2. Wipe each piece of amber off with a piece of denim.
3. Apply a small amount of toothpaste to a toothbrush and brush the amber to clear out all the crevices. (In this activity, we’re not using toothpaste to prevent cavities; we’re using it to clean the amber’s cavities!)
4. After brushing, rinse the amber off in water and dry with the denim.
5. You can give the amber a nice shine by polishing it with car polish or furniture polish, but this is not necessary.
6. Each participant can place his or her piece of amber in a baggie with an “Amber Information Card” photocopied from the back of this manual. Each child can show off this natural treasure to family and friends!

This piece of amber was carefully polished by:

This is real amber (or copal) that is millions of years old. Amber starts out as a glob of resin that oozes from certain kinds of trees when they break open. The resin works like medicine on the tree’s bark because it has special chemicals that help fight off fungi and bacteria, but the sticky resin can also trap insects or other small objects. The resin hardens quickly and then changes slowly over time. Over millions of years, it turns into amber. When scientists find this amber today, they can see if there is anything inside the amber (an “inclusion”) and study it. All of the following things have been found inside of amber: small insects, feathers, hairs, bones, lizards, frogs, spiders, spider webs, mushrooms, pine cones, flowers, and more! (www.nature-watch.com)
AN INTRODUCTION TO STARS & CONSTELLATIONS

When you go outside at night and look to the sky, what do you see? You might see the moon, or clouds, or an airplane flying overhead. And on a clear night, you'll probably see stars. In some places, you might only be able to see a handful of stars, but in many areas you can spot thousands of stars across the sky. Stars can only really be seen at night (except for the sun), but today we have a way to see stars in the daytime!

Scientists who study outer space are called astronomers. Astronomers use the word "universe" as the name for everything that exists on Earth and in outer space. When we look to the sky at night, we see lots of twinkling "lights," but these lights are in fact many different types of objects—stars, planets, black holes, galaxies, nebulas, asteroids, as well as man made objects like space stations and satellites.

Outer Space: A star is a massive ball of gas that burns brightly out in the universe. The closest star to Earth is the Sun, which is the source of most energy on Earth. There are trillions of stars in the universe, but they are only viewable for us at night when the Sun isn't outshining them. Within the universe, stars are grouped in galaxies, which are also composed of gas and dust. The size of galaxies can vary in terms of the number of stars they contain—"dwarf galaxies" contain only 10 million stars, while "giant galaxies" may contain one trillion stars (that's 1,000,000,000,000). We live inside the "Milky Way" galaxy—on some nights, you can see the other stars in our galaxy as a "milky"-looking band crossing the sky.

Within many galaxies are celestial bodies known as planets. Planets always revolve around (or "orbit") a star, and are kept in their orbits by gravity, the same force that holds people and objects down to the surface of the Earth. Often there are other objects that surround planets, like moons. We know that our moon shines some light on us at night, but other planets have moons too! In fact, any celestial body that orbits around another celestial body is called a moon. A star plus any planets and moons that revolve around it is a solar system. Our solar system contains eight planets, their 166 known moons, five dwarf planets, and other small bodies (including asteroids, comets, meteoroids, and dust).

Stars: When we look at stars in the sky, it appears that they are all stuck to a big black "wall" in the distance. In fact, some stars are far off in the distance, while others are much closer. Astronomers classify stars by their color. From hottest to coolest, the star colors are: blue, white, yellow, orange and red. These colors are the same as you'd see in a fire—most of the fire looks orange or red, but the hottest portions of the fire may appear white or blue. Stars also vary in size—in general, as a star gets older it shrinks and becomes denser and hotter (sometimes after expanding very large first). Stars don't live forever—although they burn for a long time (often for billions of years!), they'll run out of gas at a certain point and die. A star's brightness depends on its size, temperature and distance from the Earth.
HOW TO MAKE YOUR CONSTELLATION KEYCHAIN

Materials:
- Sets of 5 Constellation Medallions (cardboard circles with many holes punched)
- Plain medallions (cardboard circles with only 1 hole punched)
- Copies of constellation information cutouts from back of this manual
- Keychains
- Glue
- Pencils, markers, or crayons (you provide)
- Scissors (you provide)

Directions:
1. Distribute one blank medallion and one constellation information cutout (copied from the back of the manual) to each participant. Have participants write their names on the cutout, glue it to one side of the medallion and set it aside to dry. (Ensure that you use the medallion with only one pre-pressed hole near the edge.)
2. Each of the other 5 medallions represents one of 5 constellations. To avoid confusion, distribute and work with one constellation at a time.
3. Distribute one constellation medallion. Have participants remove all of the pre-pressed “dots” to reveal the holes. Once all holes have been punched, ensure that the constellation is right side up (see diagrams below).
4. Share the story of the constellation as participants connect the stars and label the medallion with the constellation’s name.
5. String together all six medallions on a keychain.

HOW TO USE THE CONSTELLATION KEYCHAIN
Seeing the constellations during the day is easy with the Constellation Keychain! All you need is a flashlight (if you’re inside) or an area with direct sunlight (if you’re outside). If you are using a flashlight, ensure that it has only one lightbulb and is not a multi-bulb LED light. To see a constellation, hold a medallion out about a foot away from any surface (the ground or a wall will work). Shine a flashlight at it, or let the sunlight hit it, and you’ll see the “stars” of a constellation projected on the surface. Repeat this for each constellation. Observe the differences between constellations and encourage participants to spot those same constellations tonight in the night sky!

CONNECTING THE DOTS ON YOUR CONSTELLATIONS

Big Dipper
Orion
Pisces
Canis Major
Leo

Candle lit Constellations
1. Start with an empty medium to large size can.
2. Turn the can upside down.
3. Using a marker, draw the stars of a constellation on the outside bottom of the can.
4. Fill the can with water & freeze completely.
5. Once frozen, place can bottom side up on a firm surface. Using a punch or large nail and hammer, punch a hole for each star. (The frozen water is needed to support the can so that it doesn’t collapse/dent when being “punched”)
6. Remove the ice/water.
7. Place a candle under the can at night to reveal the constellation in the can bottom.
INTRODUCTION CONTINUED

There are many different types of stars in the universe—some are relatively small, while others are humongous (100-200 times larger than the sun).

- **Red dwarf** stars are relatively small stars that live for a very long time. They appear red since they don’t burn as hot as other, brighter stars. Red dwarf stars are smaller than the sun (sometimes only by a little bit, and others several hundred times smaller). These are the most common stars in the universe, but are hardest for us to see since they aren’t very bright.

- **Main-sequence stars** are medium-sized stars like our Sun. Over 90% of the stars in the universe are main-sequence stars. They burn their fuel faster than red dwarves, which allows them to look brighter, but also means that they don’t live as long. When this type of star dies, it expands into a very big **giant star** and then shrinks back again to a small star called a **white dwarf**, surrounded by a colorful cloud of gas known as a planetary nebula.

- **Blue giant stars** are very large stars that burn their fuel quickly and brightly. Because they burn fuel quickly, they don’t live very long—when blue giants die, they grow very large but instead of shrinking back down to nebulas like main-sequence stars, they have a **supernova** explosion that is extremely bright and can be seen from very far away. After the huge explosion, all the matter that’s left shrinks down into a tiny particle the size of an atom, called a **black hole**.

- **Supergiant stars** are the largest known stars and are extremely rare. They are as large as our entire solar system. Like blue giant stars, when supergiants die they have a supernova and become black holes.

**Constellations:** People throughout history have grouped stars into arrangements called **constellations**. It’s sort of like playing “connect the dots”—you may have a sheet of paper with a bunch of random dots on it, but if you draw lines between them those dots may “become” an animal, person, or object. Constellations work the same way—when we see the panorama of stars in the sky, they simply look like a bunch of glowing lights in the distance, but people throughout history have picked certain stars and connected them to resemble a familiar object.

In fact, the entire sky is divided into 88 constellations, which include animals, people, and figures from mythology. Some easily visible constellations include the Big Dipper, Little Dipper, Orion, and Cassiopeia. The constellations you’ll be seeing today are the Big Dipper, Orion, Leo, Pisces, and Canis Major. Since many constellations were “discovered” by civilizations long ago, each one has a story—you’ll learn the story of these five constellations below.

**THE STORIES OF YOUR CONSTELLATIONS**

**Many constellations are given Latin names and have stories rooted in Greek Mythology. As your participants put together their Constellation Keychains, tell them the stories of the five constellations that are included. (See project instructions on the next page.)**

**Big Dipper:** The Big Dipper is a smaller part of the larger Ursa Major (big bear) constellation. The Big Dipper’s seven stars appear to form the outline of a ladle or dipper. The handle of the dipper makes up the tail of the bear. A Greek story explains that the Greek god Zeus once fell in love with a woman named Callisto. When Zeus’s wife, Hera, became jealous, she turned this woman into a bear. In order to protect Callisto, Zeus swung the bear by its tail and threw it up into the sky where it became Ursa Major. Sometimes the dipper appears right-side-up and other times upside-down—Native Americans associated the Big Dipper with the color of fall leaves, believing that in autumn the bowl would be upside down to pour out the leaves.

**Orion:** Orion is often referred to as the “Hunters” and is one of the largest constellations in the sky. The three most distinct stars of Orion are the three across his belt. Orion is surrounded by other significant constellations—his hunting dogs Canis Major and Canis Minor, and his prey Taurus (the bull) and Lepus (the rabbit). According to the Greek tale, Orion fell in love with Metope, one of the seven sisters of the Pleiades (the daughters of Atlas, who holds up the sky), but Metope was not interested in him. One day he was pursuing her when he stepped on Scorpio (the scorpion) and died. However, the gods felt bad for him so they put him and his dogs in the sky near the animals he hunted. They also put Scorpio at the opposite side of the night sky so Orion could never be hurt again.

**Canis Major:** Canis Major is said to be one of Orion’s hunting dogs, either chasing after Lepus (the rabbit) or ready to help Orion fight Taurus (the bull). The ancient Greeks referred to only one dog in the sky, but later on other civilizations “spotted” a second, smaller dog and named it Canis Minor. Canis Major contains Sirius, the brightest star in the night sky (and sometimes referred to as the “dog star”). The Greeks associated Sirius with the Sun since they both appeared in the same portion of the sky during the summer—they believed that the heat of Sirius tied to the heat of the sun. This is where the term “dog days of summer” comes from.

**Leo:** Leo is identified as the Nemean Lion, a vicious beast from Greek mythology. The lion descended to Earth from the moon in the form of a meteor and ravaged the countryside. The lion had such tough skin that it could not be punctured by spear or arrow. The warrior Hercules killed the lion by strangling it, and later used the lion’s skin as his shield for protection while completing his quests. Hera, Zeus’s wife, was angry at Hercules’s success, so she raised the soul of the lion in to the sky as Leo for eternity.

**Pisces:** Pisces is comprised of two fish which are tied together to the same point. According to Greek mythology, there was once an evil god named Typhon, who wanted to overthrow Zeus and all the gods. One day Aphrodite and her son Eros were walking along a riverbank. When they saw Typhon coming they jumped into the river, transformed into fish, and escaped. Some stories say that they were tied together so they would not become separated.
Q: What’s the best way to talk to a velociraptor?
A: Long distance!

Constellation Information Cutouts

**Constellation Keychain**
When we look to the night sky, we see a vast array of stars. Astronomers classify stars by their size, brightness, and distance from Earth. People throughout history have grouped stars into arrangements called constellations, which represent animals, people, and figures from mythology. The five constellations on your Constellation Keychain are the Big Dipper (a scoop or ladle that is a portion of the larger, Ursa Major constellation), Orion (the Hunter), Canis Major (the big dog), Leo (the lion), and Pisces (the fish).

These cutouts contain basic information about the constellations on the keychains that your participants have made. To use these cutouts, simply photocopy this page, then cut out the shapes along the dotted lines. Attach these cutouts to the plain medallions included in the kit using glue.
CHEWY LEMONADE FRUIT SNACKS

Turn lemonade into chewy, bouncy, lemony fruit snacks thanks to the magic of gelatin!

**SAFETY**
- Uses a knife
- Uses the microwave

**DIFFICULTY** Intermediate

**TIME** 1 hour

**YIELD** Makes 72 fruit snacks

Our favorite frozen juice concentrate for these fruit snacks is lemonade, but pink lemonade or limeade concentrates work well, too. Don’t use orange or grapefruit juice concentrates—they are too thick. To thaw the frozen concentrate, you can leave the container at room temperature for 1 to 2 hours or thaw it in the refrigerator overnight.

**PREPARE INGREDIENTS**

½ cup thawed lemonade concentrate

1 tablespoon lemon juice, squeezed from ½ lemon

2 teaspoons sugar

2 tablespoons unflavored gelatin

**GATHER COOKING EQUIPMENT**

Medium microwave-safe bowl

Rubber spatula

Oven mitts

2 silicone lemon slice molds and 1 eyedropper
- These items are included in your Young Chefs' Club subscription box. If you don't have lemon slice molds, you can use any 1-inch silicone molds.

Rimmed baking sheet or flat platter
Q: How do you ask a tyrannosaur out to lunch?
A: "Tea, Rex?"
3

Use oven mitts to remove bowl from microwave (ask an adult for help—mixture will be VERY hot). Stir mixture until fully combined and smooth.

- When the warm mixture comes out of the microwave, it might have a strong gelatin smell. Don’t worry! The smell goes away when the gelatin cools.

4

Place lemon slice molds on rimmed baking sheet. Dip tip of eyedropper into warm lemonade mixture. Squeeze and let go of bulb to fill dropper. Hold filled eyedropper over shape in mold and gently squeeze bulb to fill shape to top with lemonade mixture. Repeat until all shapes are filled in both molds.

5

Place baking sheet with filled molds in refrigerator. Chill until lemonade mixture is firm, about 30 minutes.

6

Remove baking sheet with molds from refrigerator. Push each shape inside out to remove fruit snacks, and transfer to airtight container.

7

Heat remaining lemonade mixture in microwave until warmed through and liquid again, about 30 seconds. Repeat steps 4 through 6 using clean eyedropper and molds and remaining warm lemonade mixture. Serve. (Fruit snacks can be refrigerated in airtight container for up to 1 week.)
**BLONDIES**

"Eat them in the sun so the chocolate melts a little bit!" — James, recipe tester, age 6

- SAFETY
  - Uses the microwave
- USES
  - Uses a knife
  - Uses the oven
- DIFFICULTY
  - Beginner
- TIME
  - 50 minutes plus 2 hours cooling time
- YIELD
  - Makes 16 blondies

**GATHER BAKING EQUIPMENT**

- Dry measuring cups
- Measuring spoons
- Chef’s knife
- Small microwave-safe bowl and plate
- Cutting board
- Aluminum foil
- 8-inch square baking pan
- 2 bowls (1 large, 1 medium)
- Whisk
- Rubber spatula
- Oven mitts
- Cooling rack

**YOUR NOTES:**
**PREPARE INGREDIENTS**

Vegetable oil spray

1 cup (5 ounces) all-purpose flour

¼ teaspoon baking powder

½ teaspoon salt

1 cup packed (7 ounces) light brown sugar

8 tablespoons unsalted butter, melted

1 large egg

1 teaspoon vanilla extract

½ cup pecans, chopped

½ cup (3 ounces) chocolate chips

---

1

Vegetable oil spray

**HEAT AND LINE:** Adjust oven rack to middle position and heat oven to 350 degrees. Make aluminum foil sling for 8-inch square metal baking pan. Spray foil with vegetable oil spray.

See “Food for Thought” at the bottom of this page to learn how to make a foil sling.
2

1 cup (5 ounces) all-purpose flour

¾ teaspoon baking powder

¾ teaspoon salt

WHISK DRY: In medium bowl, whisk together flour, baking powder, and salt.

3

1 cup packed (7 ounces) light brown sugar

8 tablespoons unsalted butter, melted

1 large egg

1 teaspoon vanilla extract

WHISK WET: In large bowl, whisk brown sugar and melted butter until combined. Add egg and vanilla and whisk until combined.
4

\[ \frac{1}{2} \text{ cup pecans, chopped} \]

\[ \frac{1}{2} \text{ cup (3 ounces) chocolate chips} \]

**MIX:** Add flour mixture and use rubber spatula to stir until no dry flour remains. Add pecans and chocolate chips and stir to combine. Scrape batter into foil-lined baking pan and smooth top.

5

**BAKE:** Bake until top is shiny and cracked and feels firm to the touch, 25 to 27 minutes.

- This step requires adult help!

6

**COOL:** Let blondies cool completely in pan on cooling rack, about 2 hours. Use foil to carefully lift blondies out of pan and transfer to cutting board. Cut into squares.
OPENING FLAG CEREMONY SCRIPT

“Color guard, attention. Will the audience please rise?

“Color guard, advance. Scout salute.”

“Please join me in the Pledge of Allegiance

“Two

“Color guard, post the colors.”

“Color guard, dismissed

Many packs will recite the Scout Oath and Law after the Pledge. Or you can save the Scout Law until your closing ceremony.

CLOSING FLAG CEREMONY SCRIPT

“Color guard, attention. Will the audience please rise?”

“Color guard, advance. Scout salute.”

“Color guard, retire the colors.”

“Two.”
The Pledge of Allegiance
I pledge Allegiance to the flag of the United States of America and to the Republic for which it stands, one nation under God, indivisible, with Liberty and Justice for all.

Scout Law
A Scout is Trustworthy Loyal Helpful Friendly Courteous Kind Obedient Cheerful Thrifty Brave Clean & Reverent

Scout Oath
On my honor I will do my best to do my duty to God and my country and to obey the Scout Law; To help other people at all times; To keep myself physically strong, mentally awake, and morally straight.

Outdoor Code
As an American, I will do my best to be clean in my outdoor manners, Be careful with fire Be considerate in the outdoors, and be conservation minded.