DISCOVER

4-H CLOVERBUD

SCIENCE AND TECHNOLOGY CLUBS

EXTENSION
UtahStateUniversity

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Lisa Crandall | Jennifer Beck | Stacey MacArthur | Scott Williams
Utah State University Extension

Description

The Discover 4-H Clubs series guides new 4-H volunteer leaders through the process of starting a 4-H club or provides a guideline for seasoned volunteer leaders to try a new project area. Each guide outlines everything needed to organize a club and hold the first six club meetings related to a specific project area.

Purpose

The purpose is to create an environment for families to come together and participate in learning activities that can engage the whole family, while spending time together as a multi-family club. Members will experiment with new 4-H project areas.

What is 4-H?

4-H is one of the largest youth development organizations in the United States. 4-H is found in almost every county across the nation and enjoys a partnership between the U. S. Department of Agriculture (USDA), the state land-grant universities (e.g., Utah State University), and local county governments.

4-H is about youth and adults working together as partners in designing and implementing club and individual plans for activities and events. Positive youth development is the primary goal of 4-H. The project area serves as the vehicle for members to learn and master project-specific skills while developing basic life skills. All projects support the ultimate goal for the 4-H member to develop positive personal assets needed to live successfully in a diverse and changing world.

Participation in 4-H has shown many positive outcomes for youth. Specifically, 4-H participants have higher participation in civic contribution, higher grades, increased healthy habits, and higher participation in science than other youth (Learner et al., 2005).

Updated June 2014

Utah 4-H

4-H is the youth development program of Utah State University Extension and has more than 90,000 youth participants and 8,600 adult volunteers. Each county (Daggett is covered by Uintah County) has a Utah State University Extension office that administers the 4-H program.

The 4-H Motto

"To Make the Best Better!"

The 4-H Pledge

I pledge: My HEAD to clearer thinking, My HEART to greater loyalty, My HANDS to larger service and My HEALTH to better living, For my Club, my Community, my Country, and my world.

4-H Clubs

What is a 4-H Club? The club is the basic unit and foundation of 4-H. An organized club meets regularly (once a month, twice a month, weekly, etc.) under the guidance of one or more volunteer leaders, elects its own officers, plans its own program, and participates in a variety of activities. Clubs may choose to meet during the school year, only for the summer, or both.

Club Enrollment

Enroll your club with your local Extension office. Each member will need to complete a Club/member Enrollment form, Medical History form, and a Code of Conduct/Photo Release form (print these from the www.utah4h.org website or get them from the county Extension office).

Elect Club Officers

Elect club officers during one of your first club meetings. Depending on how many youth you have in your club, you can decide how many officers you would like. Typical officers will include a president, vice president, pledge leader, and secretary. Other possible officers or committees are: song leader, activity facilitator, clean-up supervisor, recreation chair, scrapbook coordinator, contact committee (email, phone, etc.), field trip committee, club photographer, etc. Pairing older members with younger members as Sr. and Jr. officers may be an effective strategy to involve a greater number of youth in leadership roles and reinforce the leadership experience for both ages. Your club may decide the duration of officers–six months, one year, etc.

A Typical Club Meeting

Follow this outline for each club meeting:

- ☐ Call to order–President
- ☐ Pledge of Allegiance and 4-H Pledge–Pledge Leader (arranges for club members to give pledges)
- ☐ Song–Song Leader (leads or arranges for club member to lead)
- ☐ Roll call–Secretary (may use an icebreaker or get acquainted type of roll call to get the meeting started)
- ☐ Minutes of the last meeting–Secretary
- ☐ Business/Announcements–Vice President
- ☐ Club Activity–arranged by Activity Facilitator and includes project, lesson, service, etc. These are outlined by project area in the following pages.
- ☐ Refreshments–arranged by Refreshment Coordinator
- ☐ Clean Up–led by Clean-up Supervisor

Essential Elements of 4-H Youth Development

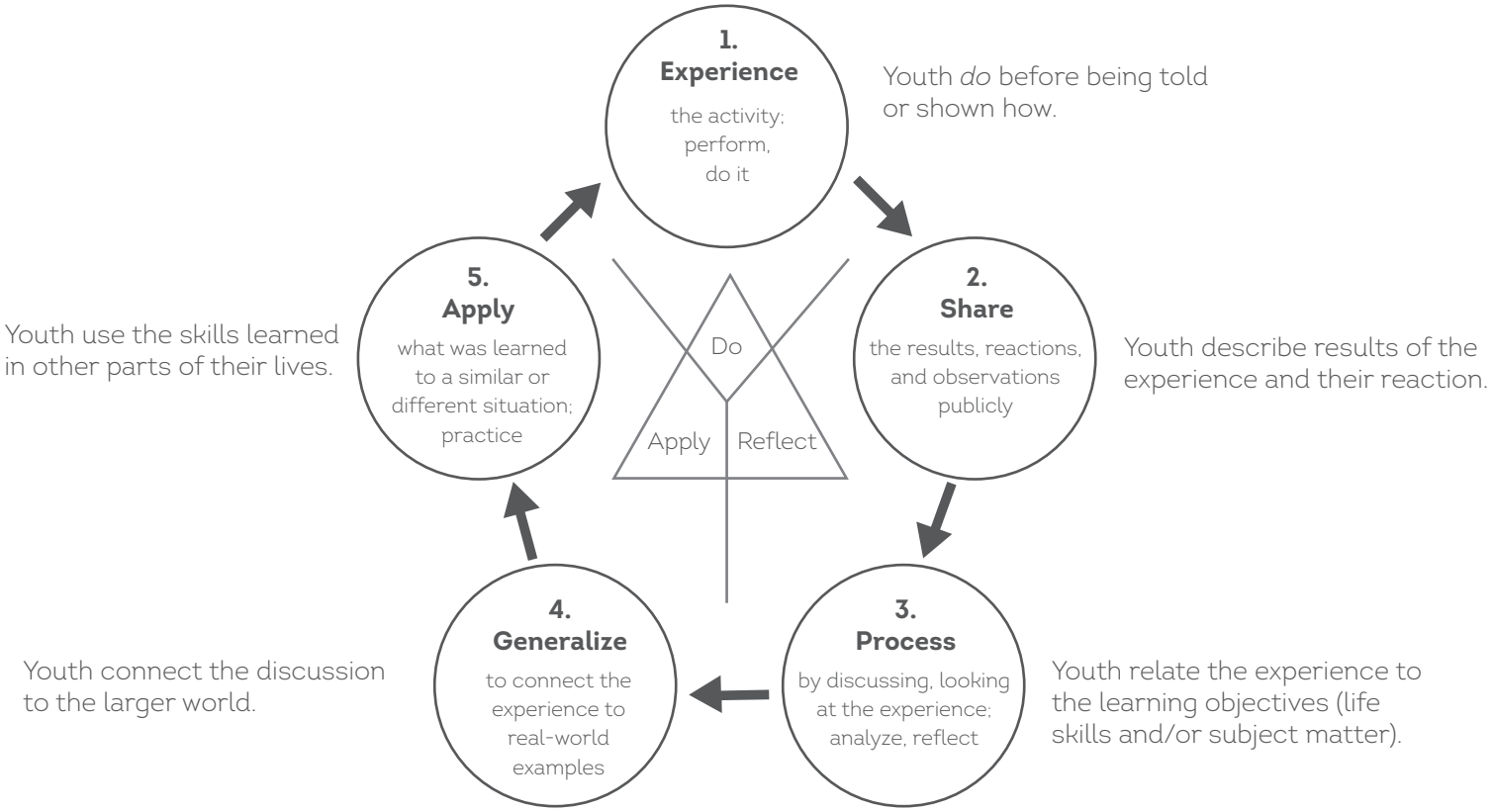
The essential elements are about healthy environments. Regardless of the project area, youth need to be in environments where the following elements are present in order to foster youth development.

1. **Belonging**: a positive relationship with a caring adult; an inclusive and safe environment.
2. **Mastery:** engagement in learning; opportunity for mastery.
3. **Independence:** opportunity to see oneself as an active participant in the future; opportunity to make choices.
4. **Generosity:** opportunity to value and practice service to others.

(Information retrieved from: http://www.4-h.org/resource-library/professional-development-learning/4-h-youth-development/youth-development/essential-elements/)

4-H "Learning by Doing" Learning Approach

The Do, Reflect, Apply learning approach allows youth to experience the learning process with minimal guidance from adults. This allows for discovery by youth that may not take place with exact instructions.



4-H Mission Mandates

The mission of 4-H is to provide meaningful opportunities for youth and adults to work together to create sustainable community change. This is accomplished within three primary content areas, or mission mandates, - citizenship, healthy living, and science. These mandates reiterate the founding purposes of Extension (e.g., community leadership, quality of life, and technology transfer) in the context of 21st century challenges and opportunities. (Information retrieved from: http://www.csrees.usda.gov/nea/family/res/pdfs/Mission_Mandates.pdf)

1. **Citizenship:** connecting youth to their community, community leaders, and their role in civic affairs. This may include: civic engagement, service, civic education, and leadership.
2. **Healthy Living:** promoting healthy living to youth and their families. This includes: nutrition, fitness, social-emotional health, injury prevention, and prevention of tobacco, alcohol, and other drug use.
3. **Science:** preparing youth for science, engineering, and technology education. The core areas include: animal science and agriculture, applied mathematics, consumer science, engineering, environmental science and natural resources, life science, and technology.

Getting Started

1. Recruit one to three other families to form a club with you.
    a. Send 4-H registration form and medical/photo release form to each family (available at utah4h.org)
    b. Distribute the Discover 4-H Clubs curriculum to each family
    c. Decide on a club name
    d. Choose how often your club will meet (e.g., monthly, bi-monthly, etc.)
2. Enroll as a 4-H volunteer at the local county Extension office (invite other parents to do the same)
3. Enroll your club at the local county Extension office
    a. Sign up to receive the county 4-H newsletter from your county Extension office to stay informed about 4-H-related opportunities.
4. Identify which family/adult leader will be in charge of the first club meeting.
    a. Set a date for your first club meeting and invite the other participants.
5. Hold the first club meeting (if this is a newly formed club).
    a. See *A Typical Club Meeting* section above for a general outline.
        i. Your activity for this first club meeting will be to elect club officers and to schedule the six project area club meetings outlined in the remainder of this guide. You may also complete a-d under #1 above.
    b. At the end of the first club meeting, make a calendar outlining the adult leader in charge (in partnership with the club president) of each club meeting along with the dates, locations, and times of the remaining club meetings.
6. Hold the six project-specific club meetings outlined in this guide.
7. Continue with the same project area with the 4-H curriculum of your choice (can be obtained from the County Extension Office) OR try another Discover 4-H Club project area.

Other Resources

Utah 4-H website: www.Utah4-h.org
National 4-H website: www.4-h.org
4-H volunteer training:
To set up login:
http://utah4h.org/htm/volunteers/get-involved/new-volunteer-training
To start modules: http://4h.wsu.edu/volunteertraining/course.html
(password = volunteer)

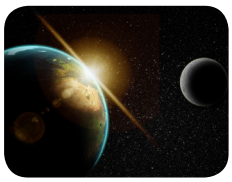
References

Information was taken from the Utah 4-H website (utah4h.org), the National 4-H Website (4h.org), the Utah Volunteer Handbook, or as otherwise noted.

Lerner, R., M. et al., (2005). Positive youth development, participation in community youth development programs, and community contributions of fifth grade adolescents: Findings from the first wave of the 4-H Study of Positive Youth Development. Journal of Early Adolescence, 25(1), 17-71.

We would love feedback or suggestions on this guide; please go to the following link to take a short survey:
http://tinyurl.com/lb9tnad

SCIENCE AND TECHNOLOGY *Meetings*



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4-H Club Meeting 1
Chemistry

Supplies

- 1 clear glass
- Warm water
- Cold water
- Food coloring
- Stopwatch or clock
- Measuring cups
- Dry cornstarch (About 1 cup for every 2-3
- Cloverbuds)
- Large bowl
- Small bowls or plates for each Cloverbud
- Bottle with narrow mouth
- Baking Soda
- Vinegar
- Balloon
- Funnel (Optional)
- Newspaper (Optional)
- Plastic sandwich bags (Optional)

INTRODUCTION

These club activities will introduce Cloverbuds to basic scientific concepts and principles. In this meeting, Cloverbuds will learn about molecules, states of matter, and chemical reactions.

PREPARATION

Whip up a batch of ooze for your Cloverbuds. You'll need 1 cup for cornstarch for every ½ cup of water. Make enough for each Cloverbud to have about 1/3 cup

Measure water and pour into a large bowl. Add several drops of food coloring, if desired. Slowly add the cornstarch to the bowl, mixing the cornstarch and water with your fingers until it's fully combined (large amounts of cornstarch will be difficult to mix at first.)

Keep adding water until the ooze feels like a liquid when you are mixing it slowly. Then try tapping on the surface with your finger. When ooze is just right, it won't splash–it will feel solid. You may need to add more cornstarch or water to get it to the right consistency.

You may consider mixing two different batches of slightly different consistencies for contrast.

Moving Molecules

ACTIVITY 1

- Ask Cloverbuds if they have ever mixed something with water and watched it change color (maybe it was lemonade or punch from a powder, or maybe they were rinsing paint brushes in water). Ask them if they think water will change color without anyone stirring it. Have them make a hypothesis. (You may need to explain that a hypothesis is a prediction about what will happen during an experiment.) *Science Mission Mandate*
- Fill a glass with cold water. Put the glass on the table and wait until the water is very still; be careful not to bump the table.

- Once the water is still, put 2-3 drops of food coloring into the water; again, being careful not to bump the glass and make sure that Cloverbuds know not to lean against the table.
- Time how long it takes for the water to change color.
- Rinse out the glass and fill it with warm water. Wait for it to become still, then put 2-3 drops of food coloring in it. Time how long it takes for all of the warm water to change color.
- Even though the water appears to be still, its atoms and molecules are constantly in motion. (You will need to explain that atoms and molecules are what make up matter. See Apply section.) Heat makes the molecules move faster, so the food coloring should spread faster in warm water and slower in cold water.

Mission Mandates

SCIENCE – Asking questions and developing hypotheses is an important part of the Scientific method. Cloverbuds can develop a habit of asking questions and speculating the answers.

States of *Matter*

ACTIVITY 2

- Give each child a bowl or plate with ooze. You may need to mix the ooze again; the cornstarch tends to settle at the bottom of the bowl with time. Encourage the children to play with it and experiment with the following:
  - Pick up a handful and squeeze it. Stop squeezing and let it drip through your fingers.
  - Rest your fingers on the surface of the ooze. Let them sink down to the bottom of the bowl. Then try to pull them out fast.
  - Try making a ball with the ooze.
  - Hold the bowl and carefully roll it around (this works better in a large bowl with thicker ooze)
  - Try pouring the ooze, either into your hand (over a container or sink) or into another bowl.
- Explain that there are three states of matter: solids, liquids, and gases (see Apply section).
- Explain to Cloverbuds that when the ooze is squished together, it acts like a solid because the molecules are pushed together. When it's not being pushed on, it acts like a liquid because the molecules are relaxed.
- When you're done, you may pour the ooze into small sandwich bags and send it home with your Cloverbuds.
- The ooze rinses off easily in water.

Chemical *Reactions*

ACTIVITY 3

- Show Cloverbuds the baking soda and vinegar and ask them if they are a solids, liquids, or gases (the vinegar is a liquid and the baking soda is a solid). Scoop 1 Teaspoon of baking soda onto a plate. Then pour 1 Teaspoon of vinegar on top of the baking soda. Watch what happens. (You may need to mix them slightly.)
- Ask your Cloverbuds if there is more Baking Soda and Vinegar or less than there was before they mixed. (There is less). Where did it all go?

- Explain that there is something called the Law of Conservation of Mass, which says that matter (all of the "stuff" in the universe") cannot be destroyed, only changed into something else. Explain that sometimes during chemical reactions, matter can combine and react to create another state of matter. In this reaction, the baking soda is a chemical called Sodium Bicarbonate and the vinegar is something called Acetic Acid. When the two combine they react and create a gas, Carbon Dioxide.
- To prove this, fill a bottle about 1/3rd of the way full of vinegar. Then fill a balloon halfway with baking soda. Put the deflated balloon over the mouth of the bottle, carefully so that no baking soda falls into the bottle. When you're ready, hold the balloon around the top of the bottle firmly with one hand and lift the balloon straight up with the other, so that the baking soda falls out of the balloon and into the vinegar in the bottle. The balloon should inflate as the gas from the chemical reaction leaves the bottle.

Mission Mandates

HEALTHY LIVING – There are lots of chemical reactions that occur in our body, like breathing and turning food into energy. Learning how those chemical reactions work can help us learn to eat and live healthier.

Reflect

- What is matter? What are the three states of matter?
- Do you think the slime is a solid or a liquid? Can you think of other things that are in between solid and liquid?
- What was our hypothesis for the first experiment? Was it correct? Did the experiment turn out differently than you thought it would?

Apply

- Matter is the "stuff" in the universe. Matter is made up of atoms and molecules, tiny building blocks that are too small for us to see. Atoms and molecules are always moving; when you heat them up, they tend to move faster, and when you cool them down they move slower.
- Matter can be in three different forms: a solid, liquid, or a gas. Sometimes matter changes from one state to another; the chemical compound H2O can take all three forms. H20 is Water; water is a liquid, but it can also be frozen into a solid (ice), or boiled and evaporated into steam. Other times, a substance can be a combination of two. Shaving cream, for example, is a liquid mixed in with so many gas bubbles it seems like a solid.
- Chemical Reactions are when atoms rearrange and change into something else. In the case of the baking soda and vinegar, the two reacted to create a gas that filled the balloon. Chemical Reactions are all around us. Photosynthesis is the chemical reaction plants use to turn carbon dioxide and water into food. Our bodies do the opposite when we breathe; we turn oxygen into carbon dioxide. Fire and the burning of fuel are also a chemical reactions. Every time your ride in a car you are using a chemical reaction to go somewhere.

Mastery

The basic principles of chemistry, such as particles and states of matter, can serve as a foundation for future scientific learning.

Independence

The Scientific Method is one way to gather information. Cloverbuds can learn to seek answers to questions they are interested in independently.

REFERENCES

HeyThatsHolly. (2013, August 4). Balloon Blow up! Experimenting Gas–Science Sunday. [Video file] Retrieved from https://www.youtube.com/watch?v=bP7xgV07glc

4-H Club Meeting 2
Sound and Vibrations

Supplies

- Enough clean, empty bottles for each Cloverbud (plastic or glass, with a small opening)
- Water
- Plastic or paper cups.
- Scissors
- String
- Pushpins or something else sharp to punch a hole in the bottom of the cups
- Paper clips

PREPARATION

Fill each bottle with water incrementally, from almost-full to almost-empty.

Make cup telephones for your Cloverbuds:

- Cut a piece of string that's around 10-15 feet long.
- Poke a hole in the center of the bottom of each cup.
- Push one end of the string through the hole into the cup, then pull it all the way through.
- Tie a paper clip to the end of the string.
- Repeat with the other end.

INTRODUCTION

In this meeting, Cloverbuds will learn about sound. They will create sound waves and discuss how they travel to our ears, causing us to hear different pitches.

Perfect Pitch

ACTIVITY 1

- Have children put a hand up to their throat and sing a song. Ask them if they feel a vibration when they talk. Have them experiment by saying "Aaahhh" and making other sounds, high and low. Explain that the vibrations they feel are their vocal chords making noise.
- Hand each child a soda bottle and then have them form a circle (try and mix it up so they aren't already standing in order from fullest to least full. Take turns blowing on the top of their bottle. Ask them what's different about the sound? They might say that some sounds are low and some are high. Explain that's called "pitch."
- Let Cloverbuds try and line up in order form lowest pitch to highest pitch. After they've accomplished this, let them experiment with changing the pitch by squeezing the bottles or filling and emptying them.
- Ask your Cloverbuds to guess why each bottle sounds different. Ask if the high pitched bottles have more water in them or less water than the rest of them.

Tuning Fork Sound *Waves*

ACTIVITY 2

- Explain that vibrations cause waves of sound and energy called sound waves.
- Show Cloverbuds a tuning fork and demonstrate how it works; explain that tuning forks are used for musicians to find a specific pitch.
- Hit the tuning fork again, then put it in a glass of water. What changed? Why? Explain that sound waves travel faster through water than they do through air. Ask Cloverbuds if they have ever tried listening to things underwater, and if they remember what it sounded like.
- Explain that sound waves can also travel through solids, which is what will happen in the next activity.

Cup *Telephones*

ACTIVITY 3

- Have children pair up, and give each child a cup telephone. Tell one child in each pair to hold the cup up to their ear. Have the other child walk across the room until the string is tight, then talk into the cup. Have them experiment talking with the string pulled to various tensions.
- Have one child pluck the string and then put the cup to their ear. Both children should be able to hear the sound. Have the children take turns plucking the string and seeing if it sounds different. Have them experiment plucking the string with various tensions.
- Explain to the children that when they pluck the string it starts to vibrate. The vibration in the string moves to the bottom of the cup and through the air inside the cup to your ear.

Reflect

- What is pitch? (Pitch is how high or low a sound is.)
- Did the bottles with a lot of water have a high or low pitch? What about the bottles with not very much water?
- What makes sound?
- How does sound travel to our ears? (Sound waves)
- How do musical instruments use vibrations to make sound?

Apply

-Our vocal chords vibrate when we talk, sing, and laugh. High notes are made by fast vibrations and low notes are made by slow vibrations. Crickets chirp by rubbing their wings together to create vibrations.

Mastery

Once Cloverbuds have a basic understanding of sounds and vibration, they can create their own experiments to learn more.

Belonging

Cloverbuds work together as a team to perform experiments and make discoveries.

Mission Mandates

SCIENCE – Energy waves like sound waves are found all over the universe. Every time you hear a sound, you know that it's caused by a vibrating object creating sound waves.

4-H Club Meeting 3
Laws of Motion

Supplies

- Balloons
- Strings
- Popsicle sticks (Optional)
- Drinking straws
- Masking tape
- Meter Stick
- Large paper or poster for charting times
- Plastic Grocery Bag
- Toy Car
- A small ramp (This can be as simple as a book propped up at an angle)

INTRODUCTION

Sir Isaac Newton was a physicist in the seventeenth century. His laws of motion and gravity (Newtonian Physics) are the basis of our understanding of physics.

Newton's First Law of Motion

ACTIVITY 1

- Ask your Cloverbuds if they know what Force is. (Force is a push or pull on an object.)
- Slide a toy car or another flat object across the floor. Eventually it will slow to a stop. Ask your Cloverbuds why they think it stopped.
- Explain that objects only stop when forces act on them. If nothing touched the car, what kind of forces could act on it?
- Have Your Cloverbuds jump up and down. When they jump off the ground, their legs are pushing them up. What pushes them back down? Explain that Gravity is the force that pushes everything down to the Earth. It's why, when we drop things, they fall to the ground. Gravity is one of the forces pushing on the toy car, and it always stays the same. The other force is called Friction. Friction is the force that occurs when two objects rub up against each other. Different objects have different amounts of friction.
- Slide the car across different surfaces such as tile, carpet, tables, grass, sand, etc. and measure how far the car goes on each surface.

  Note: You want to make sure that the initial force on the car stays the same each time, so it doesn't mess up the results. To do this, slide the car down a ramp, rather than pushing it by hand, so that it starts off at the same speed every time.

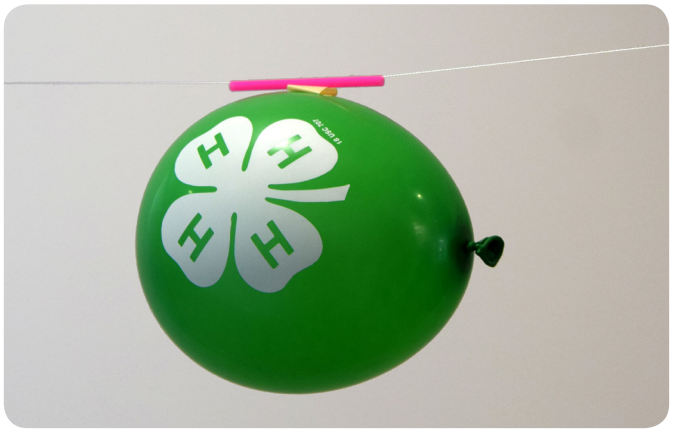
Surface 1	Distance
Trial 1	
Trial 2	
Trial 3	
Surface 2	
Trial 1	
Trial 2	
Trial 3	
Surface 3	
Trial 1	
Trial 2	
Trial 3	

- As a group, record the distances on a chart.
- See if you can put the surfaces in order from most friction to least friction based on how far the cars went. (You will most likely need to find the average for them.)
- If Friction slows the cars down, would the surfaces with more friction have longer or shorter distances? (The surfaces with the shortest distances will probably have the most friction.)

Newton's 3rd Law *(Lift Off!)*

ACTIVITY 2

- Ask the children if they have ever seen a rocket launch. Newton's 3rd Law says that every action has to have an equal and opposite reaction. For example, if you push your friend on a swing, what is the reaction? The swing moves forward. Explain that a rocket moves forward because the engine is pushing out the opposite direction.
- Have the children get involved in setting up the experiment. Feed string through a straw, then tie or tape the ends across the room or between furniture so that the string is taut. Make sure that the string is level. (You can also tape the ends of the strings to popsicle sticks and let Cloverbuds hold the ends.)
- Let the person in charge of launching the rocket blow up the balloon and pinch the ends closed rather than tie it. Have them hold the balloon closed while you attach it to the straw with the tape. Countdown, then launch the balloon. Measure the distance traveled and record it. Have the children take turns launching the balloon at different angles.
- Create a parachute out of a grocery bag and attach it to the top of the balloon. Compare the distances of the balloon with the parachute to the balloon without. How do they compare? (Remember Newton's 1st Law; the parachute is acting as a force against the balloon. This is how parachutes work in real life; the parachute drags through the air and slows down things that are falling.)



Reflect

- On which surface did the car go the fastest?
- Can you think of any surfaces that might have low friction? What about high friction? (You may prompt Cloverbuds by asking them if they can think of times they've slipped and fell, or times they've tried to push something and haven't been able to.)
- Why do you think it's important to know how forces work?

Apply

- Different surfaces have different amounts of friction. Ice has a very low amount of friction, so when you skate on it you can slide for long distances without stopping. That's also why you may slip easily when you're walking on ice outside. The same is true for wet sidewalks or tile.
- Engineers use Newtonian Physics to understand how forces will interact with things they design and build. Bridges, houses, sky scrapers, cars, airplanes, rockets, and satellites are all built with forces like gravity and friction in mind.

Independence

Let Cloverbuds make choices on how to adapt the experiments. For example, let them choose the surfaces they want to test the toy car on and the give them freedom when experimenting with the balloon rocket.

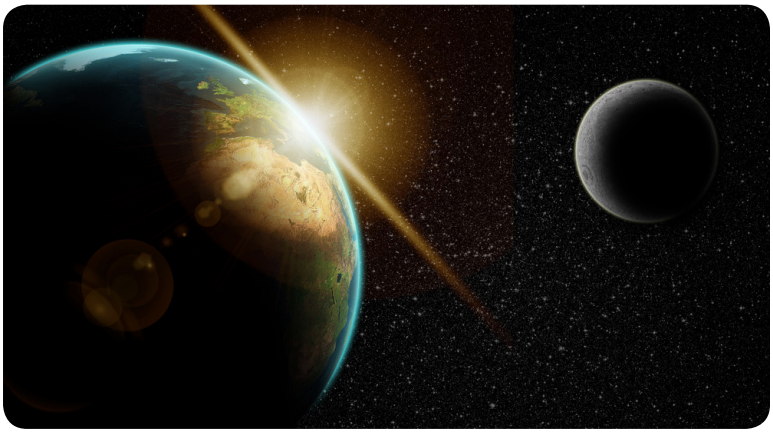
Mastery

Repeating the experiment multiple times can help ensure that the data is accurate and help Cloverbuds understand the concepts behind the experiment better. .

Mission Mandates

SCIENCE – Cloverbuds in this activity ask questions and formulate hypotheses, conduct experiments, and analyze the data to draw conclusions about physical concepts.

4-H Club Meeting 4
Blast Off!



Preparation
Watch the following Video from the Jet Propulsion Laboratory on making a Dry Ice Comet:
http://www.jpl.nasa.gov/video/details.php?id=945

Use the Model Pattern to cut out one set of shapes for each Cloverbud in heavy cardstock

Introduction
Astronomy uses information from chemistry, physics, geology, and many other branches of science. Cloverbuds will learn to apply what they've learned to a new field.

Supplies
- Black construction paper
- Self-adhesive foil stars
- White chalk or crayons
- Pictures of Constellation
- Cardstock
- Model Pattern
- Three Brads for each Cloverbud
- Pushpin or Hole Punch
- Coloring Utensils (Optional)
- 5 lbs. Dry Ice, crushed into small pieces (Available at local grocery stores)
- 1 L water
- 2 Cups Dirt
- 1 Tbsp. Starch
- I Tbsp. Syrup
- I Tbsp. Vinegar
- Thick Gloves
- Safety Goggles

Dry Ice Comet

ACTIVITY 1
- Briefly talk about the difference between comets, asteroids, and meteoroids.
  - Comets are frozen chunks of dirt, gas, and ice orbiting the Sun. They are often the size of a city.
  - Asteroids are chunks of rock orbiting the Sun. According to NASA, an asteroid the size of a car enters the earth's atmosphere and burns up about once a year.
  - Meteoroids are small piece of a comet or asteroid orbiting the sun. When meteoroids enter the Earth's atmosphere and burn up we call them Meteors, or sometimes shooting stars. If a meteoroid doesn't burn up all the way and hits the ground, we call it a meteorite.
- Tell Cloverbuds that you're going to make a comet in your kitchen.
- Have Cloverbuds help you to dump and mix the dirt, water, syrup vinegar, and starch together.
- Make sure they know that dry ice is dangerous to touch, and stay a safe distance away as you mix the dry ice into the dirt mixture with your gloves on.
- Explain the ways that your model comet is similar to real comets.

Sun, Earth, and Moon *Model*

ACTIVITY 2

- Have Cloverbuds color the circles representing the Sun, Earth, and Moon (make sure they know that the Sun is the largest and the Moon is the smallest). Color the half circle a solid, dark color. Point out that the circles aren't to scale; in reality, the sun is much, much larger than the Earth and Moon.
- Glue the moon circle to one end of the short rectangle.
- Using a hole punch or pushpin, punch a hole in the center of the circles, and in the ends of the rectangles. Punch a hole in the center of the half circle, near the straight edge, but be careful not to punch all the way through the edge.
- Hold the half circle up to the front of the "moon" circle, so that the holes line up. Push the brad through the holes, so that the prongs close on the back side of the moon circle.
- Connect the "Sun" circle to one end of the long rectangle with the brad, again making sure that the colored side is facing away from the prongs.
- Push a brad through the "Earth" circle, making sure that the colored side is facing away from the prongs. Push the other end of the short rectangle onto the prongs, followed by the long rectangle. Fold down the prongs.
- Demonstrate how the moon orbits the Earth, but the same side is always facing the Earth. The shadow, however moves so that it's always away from the Sun (the Sun illuminates the side facing it).
- Show Cloverbuds what a Lunar Eclipse, Solar Eclipse, New Moon, Half Moon, and Full Moon would look like.

Adapted from: http://www.enchantedlearning.com/crafts/astronomy/sunearthmoon/

Create Your Own *Constellation*

ACTIVITY 3

- Ask your group what they know about stars. Explain that stars are large bodies of burning gas that emit light. The Sun is a star, and it's what gives us heat and light on Earth.
- Ask the group to share their stargazing experiences. Then ask your group what they (or their parents) do when they want to go somewhere and don't know how (maybe they use a GPS or a map on a cell phone). Explain that a very long time ago people used stars to help them navigate. People thought that certain groups of stars looked like pictures or outlines of things–such as an animal, person, or an object– and named them. These groups of stars are called constellations. Show the children several pictures of constellations.
- Give each child a sheet of black construction paper and self-adhesive foil stars and have them create their own constellation. They can create their constellation with a shape already in mind, or they can put the stars down at random and then come up with a shape.
- Use white chalk or crayons to connect the stars and add details to their constellation.
- Have each child write the name of his/her constellation on the paper.

Reflect

- Why do you think it's important to learn about objects in space like Comets and Meteoroids?
- Why do you think it's important to learn about how the Earth orbits the sun?
- If you were an astronaut going out into space, what would you take with you?

Apply

Gravity, the force that pushes everything towards the Earth, is what causes the Moon to orbit the Earth, and the Earth to orbit the Sun. The Moon is close enough to the Earth that it stays with the Earth, but not so close that it crashes into it. The same is true with the Earth and the Sun.

Mission Mandates

SCIENCE – Astronomy is a large and complex field of study. It is deeply based in physics, and applies concepts from many other fields, such as chemistry and geology.

Independence

Overviews of scientific fields like astronomy give club members a chance to develop their own interests and choose what they may want to study later in life.

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4-H Club Meeting 5
Computer Science

Supplies

- Computers
- High-Speed Internet Access

PREPARATION

You'll need access to a number of computers for this activity, one for each Cloverbud. Contact a local school or library about using a computer lab.

INTRODUCTION

Depending on their age and how much exposure they've had to computers at home and at school, your Cloverbuds' knowledge of computers may be very different. Each activity in this club meeting targets a different level of learning. Feel free to skip and/or adjust activities as necessary. (Note: You may want to have Cloverbuds of different ages/skill level working on different activities at the same time.)

Using a Computer

ACTIVITY 1

- Review with your Cloverbuds the basic components of a computer. Ask Cloverbuds to point to the components (i.e. mouse, keyboard, monitor, etc.) of their computer. This may help you get a better idea where your Cloverbuds are in their computer knowledge.
- With each component, ask your Cloverbuds if they know what it does. If some are unsure, make sure to go over it.
- Show Cloverbuds how to power on their computer and help them in log in if necessary.

The Mouse and Keyboard

ACTIVITY 2

- Help Cloverbuds get used to using the mouse and keyboard through playing fun games online.
    1. Help Cloverbuds become familiar with where the letters are on the keyboards.
        - Easy: http://www.abcya.com/typing_rocket_junior.htm
        - Hard: http://www.abcya.com/typing_rocket.htm
    2. Clicking and Mouse Activities (under "Skills")
        - http://www.abcya.com/first_grade_computers.htm#more-cat

ACTIVITY 3

- When Cloverbuds feel comfortable using the computer, introduce them to the concept of coding.
- Explain that Coding is how we tell the computer what to do. Computer Programs, no matter how complicated, are always made up of a combination of simple commands.
- Have Cloverbuds play Lightbot, a puzzle game that teaches basic principles of coding. (Note: Younger Children may need help reading the instructions.)

  http://lightbot.com/hocflash.html

Mission Mandates

SCIENCE – Computer Science is an important branch of science, and becomes more so each year. Teaching Cloverbuds Computer Science early on will help them to develop the necessary skills they'll need later in life.

Reflect

- Why do you think it's important to know how to use computers?
- Why do you think it's important to learn how to code?

Apply

Are there any computer skills that you don't know how to do yet, that you want to learn?

Mastery

Help Cloverbuds see that Computer Science is something that is learned and mastered over time. Keyboarding and Coding take time and practice to learn, just like Reading and Writing.

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British Broadcasting Channel. (2015). Programming Classroom Resources. Retrieved from http://www.bbc.co.uk/education/topics/zhy39j6/resources/1

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4-H Club Meeting 6
The Internet

Supplies

- Computer and Internet Access
- 4 Pictures of Adults, Cut Out from Magazines
- Paper
- Drawing Utensils

INTRODUCTION

Children today are surrounded by technology; it is important for them to learn the basics of using the internet safely and understand the dangers that are online.

PRIOR TO MEETING

Cut out 4 pictures of adults from magazines, and glue them to pieces of paper. Make up short descriptions of these adults and write them on the back (try to avoid physical descriptions). Some examples are:

- I live in an apartment with my two dogs.
- I like to read and watch movies.
- Every Saturday I go on a bike ride through the park.

Include three or four of these for each person.

How the Internet Works and Online Dangers

ACTIVITY 1

- Explain to your Cloverbuds what the Internet is (The internet is a network of computers, phones, and other mobile devices that are all connected. Some of those are called web servers, and they're what keep the internet running. When you go on to the internet, you accesses websites in the World Wide Web through a Web Browser and view Webpages).
- Review Relevant Vocabulary such as webpage, web browser, hyperlinks, online, upload, and download.

  Brainstorm things that the Internet can be used for (communicating with others, finding information, entertainment, etc.).
- Explain that the internet is an excellent resources for getting information. Brainstorm some things that might be helpful to look up on the internet (Ex: telephone numbers, addresses, instructions to make something such as a recipe, buying something you can't find at a nearby store, etc.). Not all parts of the internet are good, however.
- Explain that there are things online that are dangerous.
  - Malware: Malware (Malicious Software) are programs the get installed on your computer without you knowing it. Many of these programs try and steal important personal information off of your computer. Some of these programs are called viruses; they make your computer "sick" and spread to other computers through email. Be careful what you download and install, and if you go to a website that looks suspicious, ask a parent or teacher for help.

- Phishing: Phishing is when someone tries to trick you into giving them your personal information. Sometimes someone might pretend to be a relative or family member, other times they might send you to a fake website that looks just like the real one and ask you to enter personal information.

Adapted from: http://www.bbc.co.uk/education/guides/z8nk87h/revision/1 and http://www.bbc.co.uk/education/guides/z9p9kqt/revision

Strangers *Online*

ACTIVITY 2

- Give Cloverbuds pieces of paper and have them fold them into quarters. One at a time, read the descriptions of the adults you wrote, and give Cloverbuds two or three minutes to draw what they think that person looks like.
- Once you've read all the descriptions, go back and reread the descriptions, showing Cloverbuds the picture that goes along with it. Did the people in the pictures look how the Cloverbuds imagined them?
- Ask Cloverbuds what strangers are. (Strangers are people we don't know.) Ask Cloverbuds what kind of things they shouldn't share with strangers (where you live, your phone number, your full name, where you go to school, etc.). Explain that some information could put them in harms way, while other information will not.
- Ask Cloverbuds if there are strangers online. Discuss different ways that they might come across strangers online. Some examples might be games, email/instant messaging, comments on websites, etc.
- Explain that with the Internet, you can never be sure if the person you're talking with is really who they say they are. They might be using a fake name, age, or even picture.

Adapted from: http://www.edutopia.org/blog/internet-safety-younger-elementary-mary-beth-hertz and http://www.ncpc.org/topics/internet-safety/internet-safety-grades-4-5

Internet *Safety*

ACTIVITY 3

- Watch the following video on internet safety: https://jr.brainpop.com/artsandtechnology/technology/internetsafety/
- Discuss ways to stay safe online.

Reflect

- When should you put personal information about yourself online? (Never, unless a parent or a teacher says it's okay.)
- What should you do if you see something bad on the internet? (Tell your parents or teacher)
- What should you do if someone tries to show you something on the internet that you know you shouldn't be looking at? (Tell your parents or teacher)

Apply

- Where else, other than online, might you need to be smart about strangers?
- Be careful what you watch, view, and read online. If you ever see something you know is wrong or if feel uncomfortable about something, tell a teacher or a parent!

Belonging

There are many groups, organizations, and communities online. Teaching Cloverbuds online manners and etiquette, safety, and responsibility can help them to become better members of the global community.

Independence

Teaching Cloverbuds about Internet Safety now will help to them to be safer online when they are using the internet independently as teens or adults.

Mission Mandates

CITIZENSHIP – Never say anything online that you wouldn't want to say if they were standing in front of you. Just because you can't see a person, doesn't mean that you shouldn't be respectful, polite, and use good manners.

HEALTHY LIVING – There are many things on the internet that could harm you. "Safety First" is an important rule to remember when browsing the internet. If you are unsure about anything, make sure to discuss it with a parent or teacher before moving forward.

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National Crime Prevention Council. (2015). Internet Safety: Activities and Lesson Plans for Grades 4-5. Retrieved from http://www.ncpc.org/topics/internet-safety/internet-safety-grades-4-5

More to Discover

Congratulations on completing your Discover 4-H club meetings! Continue with additional curriculum in your current project area, or discover other 4-H project areas. Check out the following links for additional 4-H curriculum.

1. http://utah4h.org/htm/discover4hclubs
2. http://www.4-h.org/resource-library/curriculum/
3. http://utah4h.org/htm/resource-library/view-all-curriculum

Become a 4-H Member or Volunteer

To **register** your Utah club or individuals in your club visit:

http://www.utah-4.org/htm/staff-resources/4-h-online-support

http://utah4h.org/htm/about-4-h/newto4h/

Non-Utah residents please contact your local 4-H office:

http://www.4-h.org/get-involved/find-4-h-clubs-camps-programs/

Stay Connected

Visit Your County Extension Office

Stay connected with 4-H activities and news through your county Extension office. Ask about volunteer opportunities and don't forget to register for your county newsletter. Find contact information for counties in Utah here:

http://extension.usu.edu/htm/counties

Enjoy the Fair!

Enter your project or create a new project for the county fair. Learn about your county fair and fair judging here:

http://utah4h.org/htm/events-registration/county-fairs

Participate in Local or State 4-H Activities, Programs, Contests or Camps

For Utah state events and programs visit:

http://utah4h.org/htm/events-registration

http://www.utah4h.org/htm/featured-programs

For local Utah 4-H events and programs, visit your county Extension office.

http://extension.usu.edu/htm/counties

Non-Utah residents, please contact your local 4-H office.

http://www.4-h.org/get-involved/find-4-h-clubs-camps-programs/

Discover *Service*

Become a 4-H Volunteer!

http://www.youtube.com/watch?v=UBemO5VSyK0

http://www.youtube.com/watch?v=U8n4o9gHvAA

To become a 4-H volunteer in Utah, visit us at:

http://utah4h.org/htm/about-4-h/newto4h/

Serve Together as a 4-H Club or as an Individual 4-H Member

Use your skills, passions, and 4-H to better your community and world. You are needed! Look for opportunities to help in your area or participate in service programs that reach places throughout the world (religious groups, Red Cross, etc.).

Hold a Club Service Project

USU Collegiate 4-H Club hosted "The Gift of Giving" as a club activity. Club members assembled Christmas stockings filled with needed items for CAPSA (Community Abuse Prevention Services Agency).

http://tinyurl.com/lu5n2nc

Donate 4-H Projects

Look for hospitals, nursing homes, or other nonprofit organizations that will benefit from 4-H projects. Such projects include making quilts for CAPSA or Primary Children's Hospital, or making beanies for newborns. During Utah 4-H State Contests, 40 "smile bags" were sewn and donated to Operation Smile.

Partner with Local Businesses

92,000 pounds of processed lamb, beef, and pork were donated to the Utah Food Bank in 2013 by multiple companies.

http://tinyurl.com/pu7lxyw

Donate Money

Clubs or individuals can donate money gained from a 4-H project to a worthy cause. A nine-year-old 4-H member from Davis County donated her project money to help a three-year-old battle cancer.

http://tinyurl.com/mqtfwxo

Give Us Your *Feedback*

Help us improve Discover 4-H curriculum. We would love feedback or suggestions on this guide; please go to the following link to take a short survey:

http://tinyurl.com/lb9tnad