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A Moment of Science Club

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NEBRASKA HONORS PROGRAM
CLC EXPANDED LEARNING OPPORTUNITY CLUBS
INFORMATION SHEET

Name of Club: A Moment of Science

Age/Grade Level: Middle Schoolers

Number of Attendees: (ideal number) : 10-20

Goal of the Club: (learning objectives/outcomes)

The goal of our club is to expose the youth to science and show them how important and fun science is in the real world. Youth should be able to successfully perform experiments and understand how they occur.

Resources: (Information for club provided by)

Online resources

Content Areas: (check all that apply)

- Arts (Visual, Music, Theater & Performance)
- Literacy
- STEM (Science, Technology, Engineering & Math)
- Social Studies
- Wellness (Physical Education, Health, Nutrition & Character Education)

Outputs or final products: (Does the club have a final product/project to showcase to community?)

No

Introducing your Club/Activities:

A Moment of Science Club allows the youth to learn about science concepts through engaging in interesting science experiments.

General Directions:

Give directions on experiment step by step. Once experiment is over, give directions to quiet down and listen to explanation. Once children understand the concept of experiment, give directions to clean up.

Tips/Tricks:

Be sure to keep students focused, while still allowing them to be creative and independent.

Lesson Plan Worksheet

Lesson Activity Name:	DIY hand sanitizer
Length of Activity:	15 minutes
Supplies:	91% Isopropyl Alcohol (70% is also okay if 91% is not available) Aloe Vera Gel Plastic bags
Directions:	
<ol style="list-style-type: none">1. If using 91% isopropyl alcohol: use 2 parts alcohol to one part aloe2. If using 70% isopropyl alcohol: use 9 parts alcohol to one part aloe3. Based on alcohol percentage, add proper ratio to bag and mix	
Conclusion of the activity:	
Students will learn about more of the science behind hand sanitizer and how it works, other safety measures to take and the science behind them as well as the general science behind COVID-19.	
Parts of activity that worked:	
The students were able to successfully make the hand sanitizer with ease and it was a great way to talk about what is going on surrounding COVID and learn more of the science behind it.	
Parts of activity that did not work:	
The experiment can get slightly messy trying to pour and mix everything together in plastic bags. It also is not a very long experiment so it needs to be added to another experiment or have a lot of stuff to talk about during/before/after the experiment.	

<https://kidsactivitiesblog.com/135592/homemade-hand-sanitizer/>

LESSON PLAN WORKSHEET

(copy table as needed)

<https://www.stevespanglerscience.com/lab/experiments/strawberry-dna/>

Lesson Activity Name:	A closer look at the DNA of a strawberry
Length of Activity:	40 mins
Supplies:	Dish soap 50 ml beaker or test tube 250 ml beaker plastic bag strainer tweezers **if tweezers are not available a spoon will work fine strawberries measuring spoon salt refrigerated isopropyl alcohol water

Directions:

- 1) Measure out 90 ml of water and add to 250 ml beaker ~ little more than ¼ cup
- 2) Add 10 ml of dish soap to 250 ml beaker ` little over half a table spoon
- 3) Add ¼ tsp of salt to 250 ml beaker
- 4) Stir
- 5) Place one strawberry in plastic bag
- 6) Add contents of 250 ml beaker to plastic bag with strawberry inside
- 7) Seal bag
- 8) Mash up strawberry in bag until in small pieces
- 9) Strain contents of bag in to previously used 250 ml beaker to separate solids and liquids, press solid with spoon to get out excess liquid
- 10) Pour liquid in 250 ml beaker in to 50 ml beaker
- 11) Add 5 ml of chilled isopropyl alcohol
- 12) Observe results and remove white film (dna), with tweezers

Conclusion of the activity:

Students should observe the process of removing DNA from a strawberry, and understand the basics of what DNA is and its function.

Parts of activity that worked:

The students were able to see some DNA of the strawberry form and seemed very engaged. We were not provided beakers so we ended up using clear cups which seemed to be very helpful because the students could see everything happening and still worked fine.

Parts of activity that did not work:

Some of the plastic bags leaked or got all over when the students were trying to mash up the strawberry with the liquid. We were not provided a strainer, so there was still some chunks of strawberry left in the cup making it harder to really see the DNA that had formed. We were also not provided any measuring tools, so some of the measurements may have been slightly off and we had to use hand soap instead of dish soap, the reaction still worked, but maybe could have worked better with more exact measurements and correct materials.

Lesson Plan Worksheet

(copy table as needed)

Lesson Activity Name:	Color changing milk
Length of Activity:	About 20 minutes
Supplies:	2% or whole milk Milk Liquid Food Coloring Liquid Dish Soap Disposable Bowls Q-Tips
Directions:	
1) Pour a small amount of milk into bowl, enough to cover the bottom 2) Add drops of food coloring to the milk, close together and in the center 3) Place a drop of dish soap on cotton swab (Q-tip) 4) Place Q-tip in the center of the milk and hold for 10-15 seconds 5) Repeat process in different areas of the bowl to see how it changes the pattern/ outcome	
Conclusion of the activity:	
Students should observe the reaction of the food coloring being pushed to the sides and forming a pattern. After hearing the lesson, students should understand the different macromolecules, non-polar vs. polar, and how the soap and milk react to make this cool experiment.	
Parts of activity that worked:	

The dye worked very well to when the dish soap was added and the kids seemed to find it very cool.

Parts of activity that did not work:

We did not get disposable bowls, instead we had to use food trays which started to leak after a while from the milk.

<https://coolscienceexperimentshq.com/magic-milk-science-experiment/>

Lesson Plan Worksheet

Lesson Activity Disappearing ink

Name:

Length of Activity: 30 mins

Supplies:

Baking Soda

Water

Q-tips

Grape juice

Paint Brush

Paper bowls

Plastic Spoon

Paper

Directions:

- 1) Add $\frac{1}{4}$ cup baking soda to the paper bowl
 - 2) Add $\frac{1}{4}$ cup of water and mix with spoon
 - 3) Using a Q-tip, draw/write something on the piece of paper
 - 4) Allow paper to dry
 - 5) Using a paint brush, paint grape juice on to the area with the secret message
 - 6) See the secret message written previously
-

Conclusion of the activity:

Students should understand the basic concept of an acid-base reaction as well as physical signs of a chemical reaction.

Parts of activity that worked:

Students were allowed to be creative and draw whatever they would like, they saw how the reaction worked and they could then see their drawing again.

Parts of activity that did not work:

It is important to not put too much liquid on the paper when drawing because otherwise it will not dry fast enough and they will have to wait for it to dry and won't have time to see their picture. Also, the baking soda and water do not mix completely, so it is important they are not sticking their paint brush in the baking soda at the bottom or it will get all over their paper and will not dry/react properly.

<https://www.kidzworld.com/article/3844-making-invisible-ink-appear>

Lesson Plan Worksheet

<https://www.livescience.com/21536-oobleck-recipe.html>

Lesson Activity Name: Oobleck!

Length of Activity: 30 mins

Supplies: Water
Cornstarch
Food coloring
Paper Bowls
Plastic Spoons

Directions:

- 1) Add 1 part water to bowl
 - 2) Add cornstarch, small amounts at a time, until a gooey consistency is met
 - 3) If spoon is hard to stir with, use hands to mix it better
 - 4) Once consistency is met, slowly add food coloring if wanted
 - 5) Continue mixing until all of the color is evenly mixed throughout
 - 6) Be sure to wash hands afterwards if used for mixing
-

Conclusion of the activity:

Students will understand the components of what a state of matter is and what oobleck is classified as (a non-Newtonian fluid).

Parts of activity that worked:

Everything went smoothly and it seemed like the kids had a lot of fun making it and seeing the properties.

Parts of activity that did not work:

Make sure that you stress that they need to add the water in small increments and mix, otherwise it will become too watery and not work. Also, this activity does not take a super long time so probably best to have another activity with it planned

Lesson Plan Worksheet

Lesson Activity Name:	Hot dog mummification
Length of Activity:	About 20 minutes for three weeks
Supplies:	<ul style="list-style-type: none"> -disposable gloves -paper towels -hot dogs -rulers -string/yarn -scale (optional) -plastic storage containers -baking soda -piece of paper (per student)
Directions:	
<p>1. Place a paper towel down and measure hot dog on top of it 2. Measure circumference of hot dog with string/yarn and mark with pen or marker then measure with ruler 3. (optional) Measure weight of hot dog 4. Write down each measurement in lab notebook data table 5. Put at least 2.5 cm of baking soda in airtight container, place hotdog in container and completely cover with baking soda 6. Seal box and place in an indoor shaded area, do not disturb for one week 7. After one week, take hot dog out of airtight container and carefully clean off baking soda- disposing of all baking soda in container and on hot dog 8. Take new measurements to update lab notebook 9. Describe hot dog in lab notebook also (such as smells, colors, how it changed) 10. Repeat baking soda process of step 5 and 6 11. Repeat steps 7, 8, 9 12. Compare data tables 13. Dispose of everything carefully</p>	
Conclusion of the activity:	
<p>Students should be able to discuss how the mummification process works including how ancient Egyptians performed the mummification process on human beings. The components of natron salt and why baking soda was used in place of it. Several vocabulary words such as: Mummy, Mummification, Canopic jar, Natron, Desiccant, Desiccate, Sarcophagus, Embalm, and Circumference.</p>	
Parts of activity that worked:	
<p>This was a good project to do for a filler after some of our other activities for two other weeks. IT was nice to be able to teach them about science in relation to other subjects such as history. The results of the “mummification” were clearly visible and interesting.</p>	
Parts of activity that did not work:	
<p>Keeping the experiment going was hard to manage because we had to find a good place to store their hot dogs when we were not using them every week. We also were not provided a scale so we were unable to have them look at the mass.</p>	

Lesson Plan Worksheet

Lesson Activity Name: Wood Bridge Weight

Length of Activity: 40 mins

Supplies

- Popsicle Sticks
- Tape
- Straws
- String
- Scissors
- Glue
- Tooth Picks
- Paper
- Rubber bands

Directions:

- 1) Have students draw their design on a piece of paper
 - 2) Set out supplies and allow students to get creative trying to make the bridge to withstand the most weight
-

Conclusion of the activity:

The youth should be able to understand the job of civil engineers and what they do and understand how weight is distributed along a bridge and apply this to real life.

Parts of activity that worked:

The students really enjoyed getting to be creative and think about science in a different way, it allowed them to have more say over the “experiment” and do more of what they wanted with their bridge.

Parts of activity that did not work:

We did not have any weights or anything specific to test the weights of their bridges, so it was hard to make a sort of competition out of it. They also seemed to have some difficulty making a bridge with the supplies they were given and did not totally enjoy having to draw out their plan first.

Lesson Plan Worksheet

Lesson Activity Name:	Lava Lamps
Length of Activity:	30 minutes
Supplies:	Vegetable oil empty plastic water bottles food coloring water Alka-Seltzer tablets
Directions:	
1. Students will fill the water bottles about $\frac{3}{4}$ of the way with vegetable oil and about $\frac{1}{4}$ of the way with water (leaving the neck of the bottle empty) 2. Add 10 drops of food coloring to the bottle 3. Drop half of an Alka-Seltzer tablet into the bottle 4. Put the lid back on	
Conclusion of the activity:	
Students will learn about density- how oil is more dense.	
Parts of activity that worked:	
The experiment went as planned and worked very well using regular water bottles.	
Parts of activity that did not work:	
Using 1 tablet rather than $\frac{1}{2}$ of a tablet for each bottle seemed to work better and gave more of a result, be sure to keep the caps off to avoid gas build-up, do not let the students shake them a ton before the lava lamp occurs or it will not work as the oil and water somewhat mix together. It takes some time for the food coloring to settle in the water and not the oil so they need to be patient and then gently mix the food coloring in the water slightly, not over mixing it.	

Lesson Activity Name: Solar Oven

Length of Activity: 50 mins

Supplies

- Cardboard Pizza Box
- Pencil
- Ruler
- Scissors
- Aluminum Foil
- Tape
- Black Construction Paper
- Plastic Wrap
- Newspaper
- Oven Mitt
- Dish
- Thermometer
- Marshmallow
- Graham Cracker
- Chocolate

Directions:

- 1) Clean Pizza box if previously used
- 2) Use pencil and ruler to draw a square one inch from the top of the box
- 3) Cut out three of the four sides of the square
- 4) Crease the uncut side so that a flap will stand up
- 5) Cut a piece of foil to cover inner side of flap
- 6) Wrap the foil around the inner side of the flap tightly and tape it
- 7) Line the bottom of the box with black construction paper
- 8) Cut two same size pieces of plastic wrap and tape them securely to the inside edges of the square window
- 9) Roll newspaper to form tubes, still allowing it to close
- 10) Use the sun

Conclusion of the activity:

The youth should be able to understand the job of civil engineers and what they do and understand how weight is distributed along a bridge and apply this to real life.

Parts of activity that worked:

The students enjoyed setting up their mini sun oven, even if we did not get the exact result we wanted.

Parts of activity that did not work:

It does need to be very sunny for this experiment, so it would likely be better as a summer activity rather than in the fall and on a day that it is clear it will be very sunny and hot. It was also hard to find so many different pizza boxes we could use. The experiment overall is fairly hard to perfect and get to work and it requires a lot of instruction and aid.

Lesson Plan Worksheet

Lesson Activity Name:	Dancing Raisins
Length of Activity:	30-35 minutes
Supplies:	Clear cups Sprite Water raisins
Directions:	
1. The students fill a cup with water and put 10 raisins in it 2. They then observe what happens 3. The students fill a cup with Sprite and put 10 raisins in it 4. They then observe what happens again	
Conclusion of the activity:	
The students will learn that the raisins “dance” in the soda because of the carbon dioxide gas and because of the change in density.	
Parts of activity that worked:	
The raisins did float to the top and move around	
Parts of activity that did not work:	
The first time we put more than 10 raisins in, and not much happened. It is best to either put 10 or less in so more will move around and rise to the top. This is also a shorter experiment so it is best to have something else planned along with it.	