

BEST OF STEM Camp @ HOME



**Puzzlers and Activities
From The Past 9 Days**

STEM CAMP PUZZLER

SCIENCE



Photo Identification

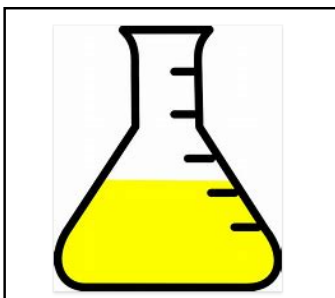
Shown below are 9 pieces of equipment found in a Chemistry Lab.

A. Your goal is to name each of the pieces of equipment shown in the space provided underneath each photo.

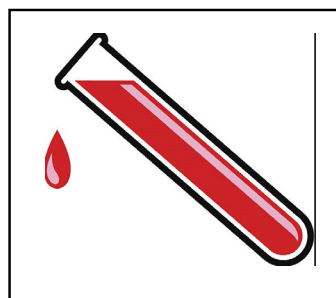
B. If you need help, the names are all shown upside down, but scrambled, at the bottom of the puzzle page.



1. _____



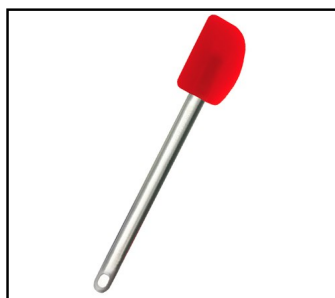
2. _____



3. _____



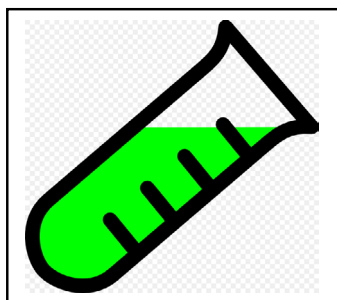
4. _____



5. _____



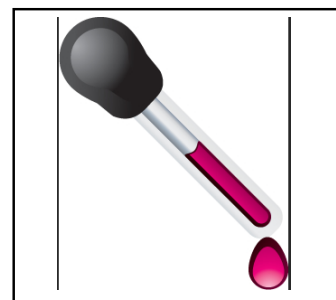
6. _____



7. _____



8. _____



9. _____

Answers: 7. Graduated cylinder 5. spatula 1. funnel 9. pipette 6. bunsen burner 3. test tube 8. safety goggles

STEM CAMP PUZZLER

SCIENCE











1 Trees

Match each of the tree names below with its picture. When you have a match, place the code in the space provided below the grid; e.g. A1B3 (no, this is not a correct answer :)



Bonsai Tree

An ancient Japanese art form in containers wherein small trees mimic the shape and scale of full size trees.

	A	B	C	D	E
1	Red Maple		Weeping Willow		Florida Palm
2		Monkey Puzzle		Macintosh Apple	White Birch
3	Balsam Fir				Blue Spruce
4			Jack Pine		Coast Redwood

ANSWERS

--	--	--	--	--	--	--	--	--	--

Correct Answers: A1C3 / C1A4 / E1A2 / B2D3 / D2D1 / E2B1 / A3C2 / E3B3 / C4D4 / E4B4

2 Insects

Match each of the insect names below with its picture. When you have a match, place the code in the space provided below the grid; e.g. A1B3 (no, this is not a correct answer :)



Aphid

A minute bug that feeds by sucking sap from plants. It may live in large colonies that cause extensive damage to crops.

	A	B	C	D	E
1	Silverfish		Dragonfly		Butterfly
2	Mantis	Cockroach			
3			Mosquito	Bumblebee	
4	Ant		Cricket		Housefly

ANSWERS

--	--	--	--	--	--	--	--	--	--

Correct Answers: A1C2 / C1D4 / E1A3 / A2B1 / B2D2 / C3D1 / D3B3 / A4E3 / C4E2 / E4B4

STEM CAMP PUZZLER

TECHNOLOGY



SPELL CHECKER

A computer programmer who specializes in web design is doing some work for a new client. Her supervisor has reminded her to “Spell Check” her work before the site goes live. . Which errors do you think the word processing program will catch? Write any correct spelling in the spaces below each incorrect word. And finally, place each word beside its correct definition below.

1 abacus	2 computer	3 electrical	4 proofread
5 encryption	6 software	7 spreadsheet	8 megabytes
9 directory	10 clipboard	11 database	12 networking

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____
- 11 _____
- 12 _____

- a. of, relating, to, or operating by electricity
- b. programs that run on a computer to perform specific functions
- c. to read and correct mistakes in a written or printed piece of writing
- d. a collection of pieces of information that have been stored on a computer
- e. a storage location on a computer that contains subsets of more information
- f. the exchange of information among individuals or computers
- g. an instrument for performing calculations by sliding counters along rods or in grooves
- h. a document that has columns and rows which are used to calculate numbers and organize information
- i. a feature of a computer program that holds a copy of some data (text/images) an allows the user to transfer the data to another document or program
- j. to change information from one form to another especially to hide its meaning
- k. a unit of computer information equal to 1,048,576 bytes (one million bytes)
- l. an electronic machine that can store and work with large amounts of information

Answers: abacus/computer/electrical/software/spreadsheet/directory 1g 2l 3a 4c 5j 6b 7h 8k 9e 10i 11d 12f

STEM CAMP PUZZLER

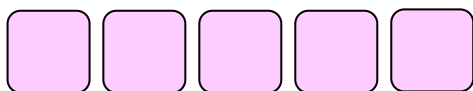
ENGINEERING



MYSTERY WORDS: Name That Engineer

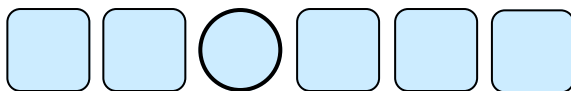
Each mixed up word below is an engineering career. Unscramble each word below (the clues may help) and then complete the mystery sentence at the bottom of the page using the letters in the circles throughout the page.

1 VILCI



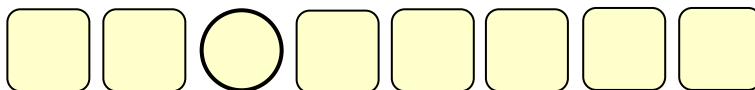
The design and supervision of construction of major public works projects , e.g. a bridge.

2 GINMIN



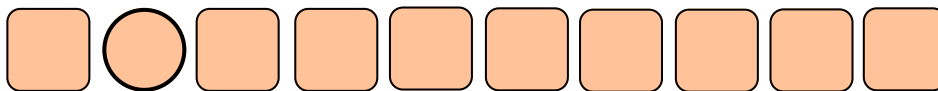
Work on-site with projects managers and labor crews, discover mineral deposits.

3 CLAMCHEI



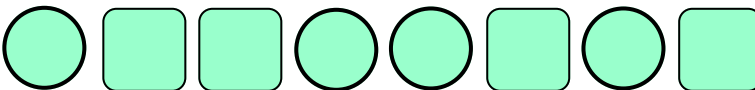
May research how certain compounds react with different types of materials.

4 CHAMNICAL



Perform engineering duties in planning and designing tools, engines, and machines.

5 TROWSAFE



Applies math and computer science to design and develop computer programs.



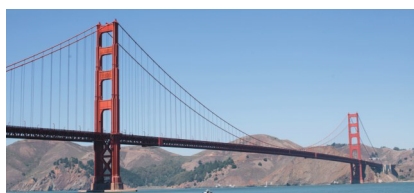
Mystery Sentence: Unscramble the **circled** letters above to complete this sentence.

One Ontario university offering an Engineering Degree.



STEM CAMP PUZZLER

ENGINEERING



True? or False? Statements

Are these statements about Engineers, or Engineering True (T) or False (F)? Circle the T or F to the right and then check the answers which are given upside down at the bottom of this page.

1. One of the structures that an engineer might build would be a tunnel.

T F

2. It was amazing that nobody died during the building of the Golden Gate Bridge in San Francisco

T F

3. Engineering is often said to have 4 main disciplines, but in fact there are several sub-branches as well.

T F

4. Nikola Tesla was a design engineer who created the system of Alternating Current (AC), still a worldwide standard.

T F

5. Engineers “shall perform services only in areas of their competence”.

T F

6. Rowan Atkinson, Mr. Bean, was a PhD student in Electrical Engineering at Oxford University.

T F

7. Jeff Bezos, Amazon, studied electrical engineering at Princeton University but flunked out in 1986.

T F

8. Alexander Graham Bell did not have a formal degree in Engineering even though he was called an engineer.

T F

9. STEM graduates are among the wealthiest people in the world.

T F

10. Chris Hadfield, engineer and astronaut first lectured a 3rd year Geography class at the University of Waterloo in the fall of 2014.

T F

11. As well as being an astronaut, Governor General Julie Payette is an engineer.

T F

12. Desperate Housewives star, Teri Hatcher has a degree in mathematics and engineering.

T F

13. Astronaut Neil Armstrong earned an aeronautical engineering degree in one year.

T F

14. The wheel was invented by an unknown engineer back around 35000 BC.

T F

15. Engineering can be defined as the application of science to solve problems.

T F

16. The Dyson Institute of Engineering and Technology in the UK offers free tuition to students who want to be engineers.

T F

17. The Royal Military College in Kingston Ontario cancelled its engineering degree program in 2016.

T F

18. Egyptian Imhotep is regarded as the first engineer, building a Pyramid.

T F

19. Jim Parson of The Big Bang Theory tv show is a civil engineer in real life.

T F

20. The Massachusetts Institute of Technology MIT is regarded as the top engineering school in the US.

T F

Answers: 1.T 2.F 3.T 4.T 5.T 6.T 7.F 8.F 9.T 10.T 11.T 12.T 13.F 14.F 15.F 16.T 17.F 18.T 19.F 20.T

STEM CAMP PUZZLER

MATHEMATICS

Calculating the Square of any Number that ends with the digit 5.

Calculation of squares is a tough task. But for the set of numbers that end with 5, this can be quite easier than before. Two-digit numbers can be calculated instantly, while numbers with more than two digits might require you to know more tables.

- Let's take the number 95 and attempt to find its square.
- As per the trick, start by writing the last two digits of the answer, which is 25 (the last two digits of the square of any number that ends with a 5 is 25).
- Now, the first digit in 95 is 9. The number that follows 9 is 10.
- Multiply 9 and 10 to get the answer, which is 90. Write 90 in the prefix of the 25 we already wrote

Easily Finding the Answer to any Number Multiplied by 11

Most children do end up memorizing the multiplication tables up to 10. But this can be taken one step further by knowing how to multiply with 11 as well quickly.

- Let's try multiplying 45 with 11.
- Separate the digits 4 and 5 with a space between them, such as 4 [] 5
- Now, carry out the addition of the two digits in the center, such as 4 [4+5 = 9] 5.
- That's your answer. $45 \times 11 = 495$.
- If the sum happens to be a two-digit number, such as with 56, which yields 5 [11] 6, simply add the tens place of the sum with the first digit.

This would then be $[5+1 = 6] [1] 6$, making the answer 616.

Multiply any Number by 9

Multiplying any number by 9

- Take a large number such as 754.
- Add a 0 at the end and subtract the original number.

That makes it $7540 - 754 = 6786$. That's how quick it is!

Multiply any Number by 15.

It might be easier with single digits. But what if you could multiply just as fast with 15 as well? Here's how.

- Let's try multiplying 79 with 15.
- Add a zero to the end of the number, making it 790.
- Divide it by 2. This gives us $790/2 = 395$.
- Add those two numbers, which would be $395 + 790 = 1185$.

Verify it with a calculator if you like.

Add 2-digit numbers at lightning speed.

By understanding the basic principles of tens and units places, you can add 2 digit numbers literally in a snap.

- Take $57 + 79$.
- Split the second number into tens and units, making it $79 = 70 + 9$.
- Finish up the tens addition, which is $57 + 70 = 127$
- Now add the remaining units place digit, which is $127 + 9 = 136$. That's it, you're done.

The answer is always 37

A cool math trick that gives the answer 37 every time.

- Choose a 3 digit number with same digits. Let's go with 333.
- Add the digits together. So, $3+3+3=9$.
- Divide the original number with this sum. So, $333/9 = 37$.
- This trick works every single time.

Multiply Numbers Quickly

Let's multiply 14×12 (answer is 168)

Multiply the two outside right numbers $4 \times 2 = 8$

Multiply the inside numbers and add them together; $4 \times 1 + 1 \times 2 = 6$

Write down the far left number which is 1. Write the inside calculation down next i.e. 6

Write the outside calculation down, 8

The answer is 168 (1 plus 6 plus 8).

STEM CAMP PUZZLER

SCIENCE



TRIVIA

Listed below are 20 trivia questions about many topics in Science. Some answers you may know, some you might guess at, and some you may have to check with a friend or Google. Have fun!

1. Which planet is closest to the sun?
(a)Earth (b)Mercury (c)Mars

A: _____

2. The Aurora Borealis is an amazing light show that shines in the northern sky. What is the name of the same glow that shines in the southern sky?

A: _____

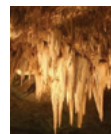
3. Who invented these three devices?



A: _____

4. Stalagmites and stalactites are formations found in caves. Which one is this a picture of?

A: It's a _____

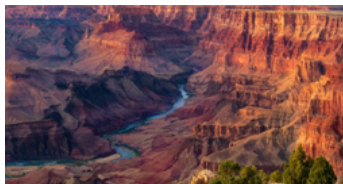


5. What colour do you get if you mix all light colours together? A: _____

6. Banana is a fruit. Corn is a vegetable. Is a tomato a fruit or is it a vegetable? A: _____

7. How many bones in the human body? (a) 4,250 (b) 206 (c) 15
A: _____

8.



A: Name the tourist site shown here

A: _____

B: What country is it found in?

A: _____

C: Name the river that flows through.

A: _____

D: What state is it found in ?

A: _____

E: What tribe have built a Skywalk?

A: _____

9. What do we call planets that exist outside our solar system? A: _____

10. What blood type is the most common?
(a) A (b) B (c) AB (d) O A: _____

11. In electricity, what do the letters DC stand for?
A: _____

12. At 151,019 miles, what country has the world's longest coastline? A: _____

13. What metal is Ag?
A: _____

14. What fraction of an ice berg is below the water line, on average?



A: ____/8ths

15.



What is this natural formation in Australia called?

A: _____

16. If water is H₂O, what is H₂O₂ ?

A: _____

17. What % of Earth is covered by water?

A: _____

18. What are clouds made up of?
A: _____

19. What is no longer a planet?
A: _____

20. What do we call Earth's outer layer? A: _____

Answers: 1. Mercury 2. Aurora Australis 3. Edison 4. stalactites 5. white 6. fruit 7. 206 8. Grand Canyon; USA; Colorado; Arizona; 9. extraterrestrial planets 10. O 11. direct current 12. Canada 13. silver 14. 7/8ths 15. Ayers Rock 16. hydrogen peroxide 17. 71% 18. water 19. Pluto 20. The Crust

STEM CAMP PUZZLER

MATHEMATICS

It's ALWAYS 37 !

A cool math trick that gives the answer 37 every time.

- Choose a 3 digit number with same digits. Let's go with 333.
- Add the digits together. So, $3+3+3=9$.
- Divide the original number with this sum. So, $333/9 = 37$.
- This trick works every single time.

It's ALWAYS 8 !

A step up from the previous one, this works on choosing any number at all.

Let's choose the number 53.

- Subtract 1 from it, so $53-1=52$.
- Multiply by 3, so $52 \times 3 = 156$.
- Add 12 to it. So, $156+12=168$.
- Divide this by 3. So, $168/3=56$.

Add 5 to this answer and subtract the original number. So, $56 + 5 - 53 = 8$.

It will ALWAYS be the Same Number.

This is the magic of the number 1089. By making use of specific calculations, no matter what 3- digit number is chosen, the answer will always turn out to be 1089. Here's how.

- Let's choose the number 537.
- Now the digits need to be rearranged in descending order, 753. This is your first number.
- Rearrange the same digits in the ascending order, 357. This is your second number.
- Subtract the second from the first, which will give us the answer, $753 - 357 = 396$.
- Now reverse the order of digits of the answer to getting the number, 693.

Let's add both numbers, $396 + 693 = 1089$, which we already knew.

Guess the AGE as well as the CHANGE

A fantastic math trick can surprise your friend in guessing his/her age as well as the change he/ she has in their pocket.

- Let's assume your friend is 8 years old and he has 2 toonies and 4 loonies bringing his total change to \$6.00.
- Ask your friend to multiply his age by 2. So, $8 \times 2 = 16$.
- Add five to the answer. So, $16+5=21$. Multiply this answer by 50. So, $21 \times 50 = 1050$
- Subtract 365 from that answer. So, $1050 - 365 = 685$.
- Ask your friend to add the total value of the change to this answer. So, $685 + 18 = 703$.
- Add 115 to this answer. So, $703 + 115 = 818$.
- Look at this answer. The last two digits are the amount of change he has, and the first digit is his age.

Subtract any 3-digit Number from 1,000.

This one is a basic trick to subtract any 3- digit number from 1000.

- Choose a 3-digit number. Let's take 496.
 - Subtract the first digit from 9. So, $9 - 4 = 5$
 - Subtract the second digit from 9. So, $9 - 9 = 0$
 - Subtract the third digit from 10. So, $10 - 6 = 4$
- The answer of $1000 - 496 = 504$

Calendar Math

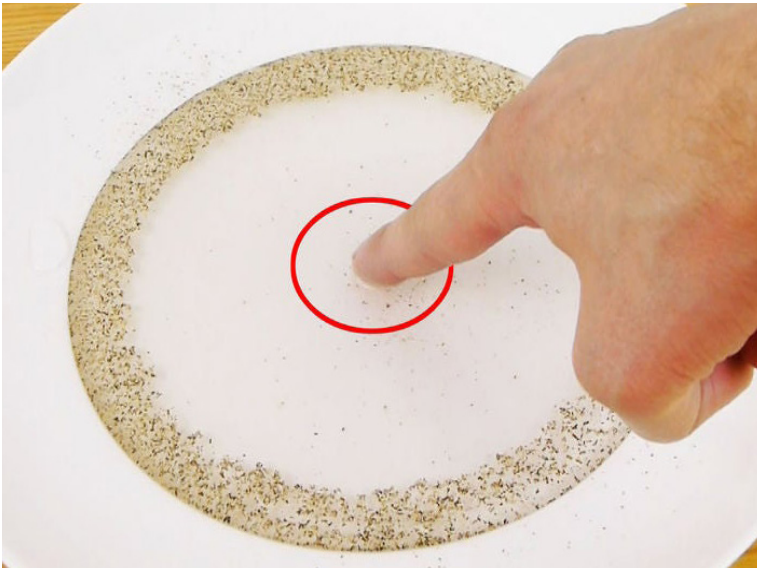
This is a fabulous trick to play with your children and maybe teach them too so that they can demonstrate it in front of their friends. Start by saying you can add any 9 numbers selected by others in a matter of seconds.

- Take a calendar and have someone choose a group of nine number in a 3×3 rectangle, and circle them.
- Choose the number in the centre and multiply it by nine.

This will give you the exact sum of all the nine numbers.

ACTIVITY OF THE DAY

Pepper and Water Science Trick



Recent headlines have stressed the importance of thorough hand washing. It is important that everybody takes this message seriously, even children. Explaining to children why it is important to wash our hands more often can be difficult. Today we have a fun activity that will help them make better sense of it all!

What you'll need:

- *Medium to large sized container or bowl*
- *Dish soap*
- *Pepper*

Step 1: Fill the container with about 4 cm of water.

Step 2: Shake pepper all over the water for 5-10 seconds.

Step 3: Get your child to dip their finger in the water. They will notice that the pepper sticks to them. The pepper represents the COVID-19 virus when we don't properly wash our hands.

Step 4: Next drop a little bit of dish soap on your child's finger and have them dip it back into the container.

The pepper will immediately float away from the child's finger. This gives children an accurate representation of how soap defends from COVID-19.

The STEM Behind the Fun!

Other than educating children on the value behind hand washing, it also teaches them about STEM principles!

The reason why the pepper moves away so quickly when you use soap is because of surface tension. Water molecules (H_2O) like to stick together. The way that the molecules are organized creates tension at the surface of the water (this is also why the pepper floats). The addition of soap changes the water tension. The water wants to keep the surface tension so the molecules pull away from the soap, bringing the pepper with them!

ACTIVITY OF THE DAY

Make Your Own Maple Syrup Candy



To kick off our 14 days of STEM Camp @ HOME we are going to make candy! This 40-minute activity will introduce kids to concentrated solutions while making a delicious treat!

Make sure to read through all of the instructions before you begin and get help from an adult!

Here is what you'll need:

- *Baking pan or hard candy molds*
- *Wax paper if you are using a baking pan. Cooking oil if using candy molds.*
- *1/2 cup of pure maple syrup (make sure it is not artificial maple syrup!)*
- *Stove (use adult assistance when using the stove and handling hot objects)*
- *Candy thermometer or digital thermometer that can withstand temperatures of at least 310° Fahrenheit or 154° Celsius*

Now for the fun!

Step 1. First set your stove to medium heat. Pour ½ cup of maple syrup into an uncovered saucepan and stir occasionally. Use a thermometer to carefully measure the temperature of the maple syrup as you begin to heat it up.

Step 2. Second, bring the maple syrup to a boil and allow it to cook, uncovered. You must stir it frequently to make sure it does not burn. Carefully use the thermometer to measure the temperature of the maple syrup as you continue to heat it. Covering the tip of the thermometer with the hot syrup is enough to measure the temperature. *It is important to not let the thermometer touch the bottom of the pan! It will result in inaccurate results.

Step 3. Once the temperature of the maple syrup reaches 230 to 235 degrees Fahrenheit, use a metal measuring teaspoon to take about one-teaspoon sample of the heated maple syrup. Be quick to pour the teaspoon of heated maple syrup onto the baking pan or candy mold. Do not touch the candies until they have cooled!

ACTIVITY OF THE DAY

Step 4. Take four more samples at each of these temperatures:

- ☐ 245 to 250 degrees Fahrenheit
- ☐ 255 to 260 degrees Fahrenheit
- ☐ 270 to 280 degrees Fahrenheit
- ☐ 300 to 310 degrees Fahrenheit

Make sure to keep track of which candy came from which temperature sample! It will be important for observation!

Take note of the consistency of the different temperature samples. Does the change in heat change anything about the syrup?

Step 5. Once all your samples are made, set them aside to cool. In the meantime, you can start clean up!

Step 6. After clean up your treats should be cool enough to eat! Try each one and note the differences. Which ones are stickier? Which ones are sweeter? Ask yourself, what effects does the temperature have on the results of the candy? Why do you think this is?

The STEM Behind The Sweets!

One of your observations was probably that the longer the maple syrup was boiled, the darker the colour and tougher the texture. The more that real maple syrup boils, the less water it will contain. This is because the heat makes the water particles evaporate. This is similar to how real maple syrup is made. Sap water is tapped from maple trees and then boiled at high temperatures to reduce the water content. The maple syrup that we like to put on our pancakes is the result of sap water without the water! What a fun and yummy activity!

ACTIVITY OF THE DAY

Make Homemade Toilet Paper



If you're finding yourself in the grocery store and there is no toilet paper available don't worry we have you covered. Today we will be making your very own homemade toilet paper!

What you'll need:

- *Any paper, except for glossy magazine paper*
- *A pot*
- *Water*
- *Aloe, baby oil, or any type of unscented lotion (these act as softening agents)*
- *Witch hazel (optional; acts as an antibacterial agent)*
- *Grass and leaves*
- *Rolling pin*
- *Mallet or hammer*
- *Sheet or towel*
- *Ladle or spoon*
- *Large cutting board or other flat board*

Now Try The Experiment!

Step 1: Soak the paper in water first to remove as much ink as you can, especially if you are using newspaper. Once at least $\frac{3}{4}$ of the ink has seeped out of the paper you can pull it from the soak water.

Step 2: After you soak the paper, place it in a pot with two handfuls of grass and leaves and cover with water. Bring this to a boil and allow it to simmer at a low temperature for one hour.

Step 3: Bring the water to a rolling boil for half an hour. You can add water as necessary and you will find foam forms on top that you will need to remove.

Step 4: After boiling, the paper becomes pulp. You will now remove the pot from the heat and remove the water from the pot without disturbing the pulp. The best method is to scoop out most of the hot water, leaving the pulp intact, and then let the rest cool. If you do need to remove the pulp from the pot, do not let it dry out. You will need to put it back into the pot when the water is gone.

Step 5: Once the pulp has been put back into the pot, mix in 4 tablespoons of oil or lotion, which will soften the paper, and just a few drops of witch hazel, if you are using it.

ACTIVITY OF THE DAY

Step 6: Spread the pulp mixture on a towel or sheet spread on a hard flat surface. You can roll it out with the rolling pin, getting it as thin as possible. If there are lumps, you can hammer these down with the mallet.

Step 7: Lay the board on top of the rolled out pulp and weight down with heavy objects.

Step 8: After 30 minutes, remove the weights and the board. You can then turn the towel or sheet over and pull it off of the toilet paper.

Step 9: Put the toilet paper out in the sun to dry.

Step 10: Once dry, you can cut it into strips.

The STEM Behind The Fun!

Creating your own toilet paper is a great way for children to understand the process of adding ingredients and the effects of combining different materials to make something new! Although we take toilet paper for granted, toilet paper has a relatively short history in the modern world. Toilet paper was initially made by an inventor named Joseph C. Gayetty in 1857. He engineered softer paper material that was loose flat sheets of paper that he called “The Therapeutic Paper”. Scott Paper Company then came out with their own in 1890 which was the first toilet paper sold in rolls and is what we currently use to this day!

ACTIVITY OF THE DAY

Fizzy Rainbow



Rainbows have to be one of the prettiest elements of the sky! With Spring on its way we will surely be seeing much more of them. Try this experiment to make your own rainbow at home!

What you'll need:

- *Baking Soda*
- *Vinegar*
- *Syringes or eye droppers*
- *Water*
- *Food colouring (As many colours as possible)*
- *A bowl*
- *A tray/baking pan*
- *Teaspoon*
- *Spoon*

Now Try The Experiment!

Step 1. Scoop 4 big spoonfuls of baking soda into a bowl

Step 2. Add 3-4 drops of food colouring

Step 3. Mix in one teaspoon

Step 4. Lay out the coloured baking soda on your tray or baking pan in one section. Try to line them vertically! *There will be clumps of baking soda however, they should not get wet.*

Step 5. Repeat Steps 1-4 with the rest of your colours.

Step 6. Fill your bowl with some vinegar. Get your child to pick it up with a syringe or eye dropper and drop it over the baking soda mixture to see the magic!

Step 7. When your child is done experimenting, pour the rest of the vinegar across the whole pan to see a bubbling rainbow!

The STEM Behind The Fun!

This experiment is based on chemical reactions. Baking soda and vinegar are both solutions. Baking soda is classified as a base solution and vinegar is classified as an acid. When an acid and a base mix, they form a gas called carbon dioxide. The gas breaking apart from the two solutions creates the “fizz”!

ACTIVITY OF THE DAY



Make Homemade Hand Sanitizer

Today we will be learning how to make our very own Hand Sanitizer. This is an activity that must be worked on with a parent and please be extremely cautious with the isopropyl alcohol around your children. We will be following WHO's (World Health Organization) Guide to create this so please follow all precautions listed in their book that's found here: https://www.who.int/gpsc/5may/Guide_to_Local_Production.pdf

What you'll need:

- *1 cup of 99% isopropyl alcohol*
- *1 tablespoon of 3% hydrogen peroxide*
- *1 teaspoon of 98% glycerin*
- *¼ cup (or 65 milliliters) of sterile distilled or boiled cold water*

Now Try The Experiment!

Step 1: Pour the alcohol into a medium-sized container with a pouring spout. The percentages on the labels of isopropyl alcohol refer to the alcohol concentration in them. You're dealing with almost pure alcohol if you've got 99.8%, whereas 70% means the bottle is only a little more than two-thirds alcohol, and the rest is water.

Step 2: Add the hydrogen peroxide.

Step 3: Add the glycerin and stir. This ingredient is thicker than both alcohol and hydrogen peroxide, so it'll take some stirring to combine everything. You can use a clean spoon for this or, if your container has a lid, you can put that on and shake it well.

Step 4: Measure and pour in the water. Measure ¼ of a cup of distilled or boiled cold water and add it to your mix. Stir.

Step 5: Sanitize your spray bottles and pour in your hand sanitizer. Spray some of your leftover alcohol into your bottles and let them sit until the alcohol has evaporated. Pour in your sanitizer.

And Don't forget to label your bottle

The STEM Behind The Fun!

Creating homemade hand sanitizer is a great way to showcase STEM to your kids. It allows them real chemistry experience and helps create an effective agent for battling viruses and germs. We hope you had fun!

ACTIVITY OF THE DAY



Make Your Own Lava Lamp

Lava Lamps have been a classic decoration for generations. However, making your own at home can teach your children about liquid density!

What you'll need:

- *Water*
- *Empty water bottle*
- *Vegetable oil*
- *Food Colouring of your choice*
- *Alka-Seltzer tablets*

Now Try The Experiment!

Step 1: Fill the empty water about 2/3 full of vegetable oil.

Step 2: Fill the rest with water but leave a little bit of space at the top. You will notice that the water sinks below the vegetable oil.

Step 3: Add about 10 drops of food colouring.

Step 4: Put the lid on the bottle and give it a gentle shake. If you shake it too hard it will form bubbles.

Step 5: Break the Alka-Seltzer tablet into four pieces. Drop them one by one into the bottle. Make sure to close the lid after all have been dropped and watch the magic!

You can use your lava lamp over and over again. All you'll need to do is add more tablets!

The STEM Behind The Fun!

The oil floats on the surface because the water is heavier (has a higher density) than oil. When we drop in the Alka-Seltzer it drops to the bottom and begins to dissolve. During this process it forms a gas, which rises to the top and takes the coloured water with it. When the gas reaches the top it breaks which causes the coloured water to fall back to the bottom.

ACTIVITY OF THE DAY

Rain Cloud Experiment



When we think about Spring, flowers are the first to come to mind. However, without rain, we wouldn't have flowers!

Today's experiment will help children understand rain clouds!

What you'll need:

- *A large clear jar or glass*
- *Shaving cream (must be foaming)*
- *Gel food colouring or washable watercolours*
- *Pipettes or droppers*

Prepping The Activity...

STEP 1: In a small cup, combine the food colouring with some water. Make sure to mix it well.

STEP 2: Fill the large jar or glass with water until it is about 3/4 full.

STEP 3: Place the jar and the cups of coloured water on the table. Place a pipette in each cup of coloured water.

STEP 4: Right before the children are ready to do the experiment, spray a bunch of shaving cream in the jar until it is just a small bit above the top of the jar. Make sure it completely covers the surface of the water.

Now Try The Experiment!

Get your children to pick up the coloured water with the pipette or droppers and squirt it on the top of the shaving cream and repeat. As they are doing this, get them to pay close attention to what is going on underneath the "cloud". The coloured water will fall through the shaving cream and flow through the water below... just like rain!

The STEM Behind The Fun!

Be sure to explain that the shaving cream represents the clouds and the water represents the air. As clouds become more saturated, they become very heavy. When the water is released it rains.

ACTIVITY OF THE DAY

Make Your Own Compass



What you'll need:

- A cork
- Scissors for cutting the cork
- A cup, drinking glass, or bowl
- Water
- A magnet. It can be a flat refrigerator magnet or a more powerful magnet, such as a neodymium magnet. A stronger magnet will work better.
- A pair of pliers
- Metal sewing needle

Now Try The Experiment!

Step 1: Rub the magnet against the sewing needle at least five times. (If you are using a weaker magnet, such as a flat refrigerator magnet, rub the needle at least a dozen times.) Always rub the magnet in the same direction against the needle. Your needle should now be magnetized.

Step 2: Now cut off about $\frac{1}{4}$ inch of the cork from one of its ends, making a small cork disc that is about $\frac{1}{4}$ inch tall.

Step 3: Carefully push the needle through the side of the disc by using the pair of pliers. Push the needle all the way through the disc so that about the same amount of needle shows on either side of the disc.

Step 4: Fill a cup, drinking glass, or bowl with at least an inch of water.

Step 5: Put the cork disc (with the needle) on the water in the cup. Try to keep the disc floating in the center of the water, away from the sides of the cup.

The STEM Behind The Fun!

This is a great STEM activity to help your child understand magnets and the interaction with the Earth's magnetic field. When you rub the sewing needle against the magnet, you magnetize the needle. Although Earth's magnetic field is relatively weak, it could clearly affect the needle because it was freely floating in the cork disc on the water. Once the needle stops moving, the needle then aligns with the Earth's north and south poles.

ACTIVITY OF THE DAY

Regrow Your Groceries!

Now a days it can be pretty tricky to find everything on your grocery list, so we have a fun activity to help you complete it at home! Using leftover parts of fruits and veggies you can re-grow your own produce!



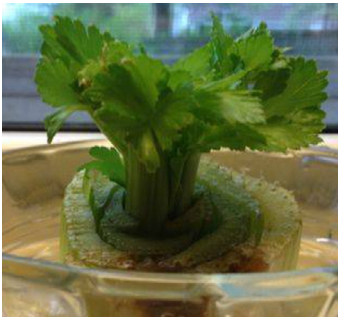
Lettuce

STEP 1: Chop off the base of your lettuce.

STEP 2: Put a little bit of water in a bowl and place the stem of your lettuce in it.

STEP 3: Put the bowl in an area where the plant will receive good sunlight.

STEP 4: After 3-4 days the stem should grow new roots. You should also see some new leaves! Once this happens you can transfer your plant into a pot of soil and continue to watch it grow. Harvest the lettuce when it is plentiful and repeat!



Celery

STEP 1: Chop off the base of your celery.

STEP 2: Put a little bit of warm water in a bowl and place the stem of your celery in it.

STEP 3: Put the bowl in an area where the plant will receive good sunlight.

STEP 4: After about a week you should notice new leaves growing. Once this happens you can transfer your plant into a pot of soil and continue to watch it grow. Harvest the celery when it is plentiful and repeat!



Potatoes

STEP 1: Peel potatoes that have eyes on them.

STEP 2: Cut the peelings into about 2 inch pieces (they must have 2-3 eyes on each of them).

STEP 3: Set them on a piece of paper towel overnight to dry.

STEP 4: In the morning move the potatoes to a pot of soil. Plant them about 4 inches deep into the soil. It is important that the eyes are facing up when planting!

STEP 5: After a couple of weeks you will notice the plant beginning to grow. Harvest them when full potatoes have sprouted and repeat!

ACTIVITY OF THE DAY



Apples

STEP 1: Remove the apple seeds from an apple.

STEP 2: Set them on a piece of paper towel overnight to dry.

STEP 3: In the morning move the seeds to a pot of soil.

*You will need at least 2 or more apple seeds to experience success! The more seeds you can save and grow the better.

STEP 4: Your crop will be ready to harvest when the apples are ripe!



Strawberries

*To give your strawberry crop the best opportunity to succeed, local and organic strawberries are best to start with.

STEP 1: Pick out the best few strawberries of the batch and use a toothpick to remove as many seeds as you can.

STEP 2: Cover a tray with high-grade soil.

STEP 3: Spread your seeds evenly over the soil.

STEP 4: Use a spray bottle to dampen the seeds and soil.

STEP 5: Add another layer of soil on top.

STEP 6: Position the tray in a warm and sunny place.

STEP 7: In about 2-8 weeks you should begin to notice leaves. Once they have 4-5 stems you can move them to a pot of soil. Your crop will be ready to harvest when the strawberries are full and red!

STEM Behind Plants!

Growing your own fruits and vegetables is a great way for children to understand what is needed for plants to grow. Not all plants are the same and require different energy sources. The plants that required sunlight undergo a process called photosynthesis. Plants need sunlight, carbon dioxide and water so they can turn it into sugar and oxygen, which allows them grow. Potatoes, and typically other vegetation that grow in the ground, don't require sunlight. Root vegetables grow edible tubers under the soil that actually shouldn't be exposed to sunlight. If they are, a chemical called solanine may be produced which can be toxic for humans.



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