
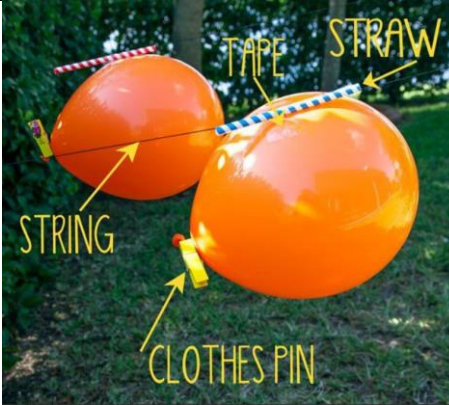

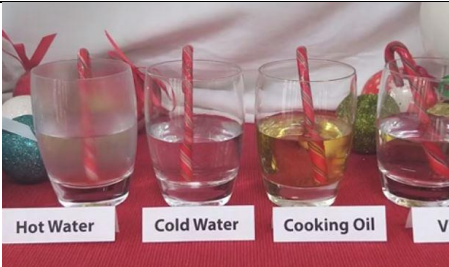
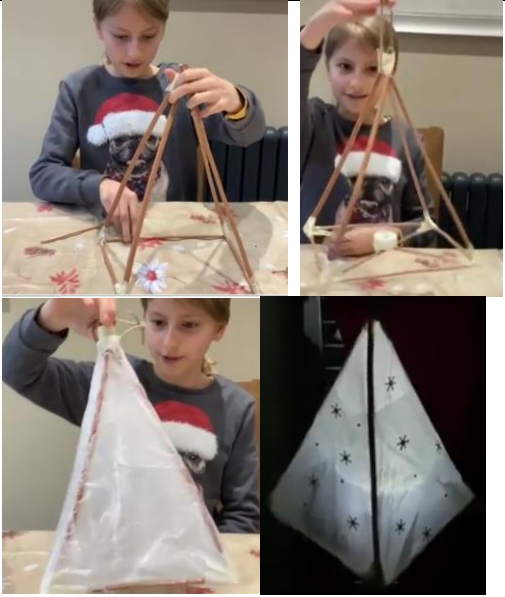
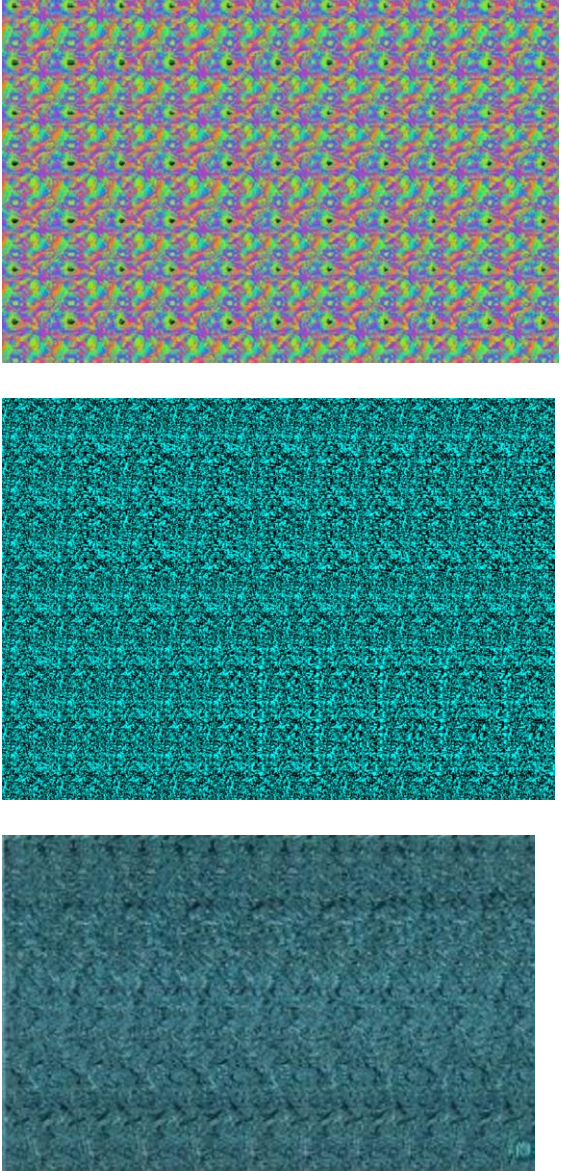


# STEM Surprise Festive Countdown

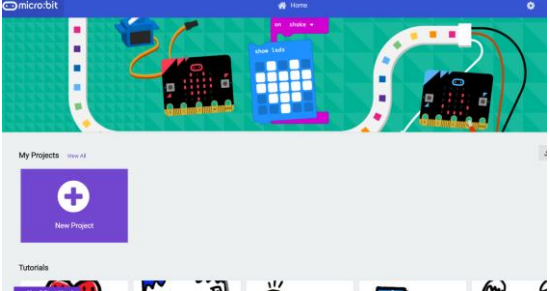
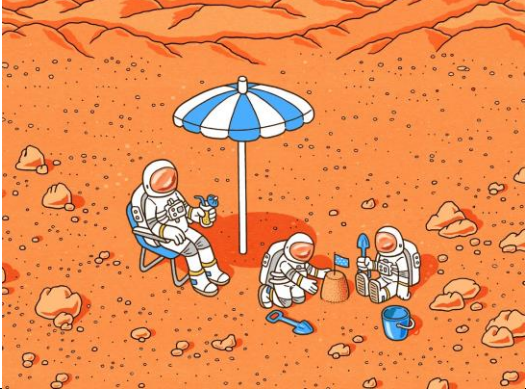





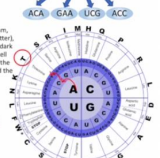



<https://thestemhub.org.uk/index.php/festive-challenge>

<p>Day 1</p>	<p>The first challenge is for children to invent a device for 2 or 3 people to use in a small boat to collect plastic from the ocean in order to help save the North Pole in the Arctic. Children can draw pictures of their device and label it. They can then take a photo of their drawing and send it in for us to see!</p>	
<p>Day 2</p>	<p>The second challenge is a Rudolf Balloon Race!                  You will need:                  String, Tape, Straws, Balloons, Pegs, Pens and anything else to decorate your balloon reindeer!                  Blow a balloon up and hold the air in it using a peg. Stick a straw to the balloon and decorate the balloon. You then need to thread the string through the straw on the balloon. Hold the string tight, let go of the peg and watch the Reindeer balloon go flying down the string!</p>	
<p>Day 3</p>	<p>The third challenge is finding out the 'power' of a candle!                  You will need:                  A candle, something to light it, kitchen scales, a timer, and something to write down your results                  First, weigh the candle and write down how heavy it is. Light the candle and start the timer. After 2 hours of it burning, blow it out. Weigh the candle to find out how heavy the candle is now and write it down. To find the 'power' of your candle, you have to complete a calculation (as seen on the video).</p>	
<p>Day 4</p>	<p>The fourth challenge is 'Dissolving Candy Canes'.                  You will need:                  4 glasses, hot water, cold water, cooking oil, vinegar, 4 candy canes, timer.                  Pour the same amount of the four separate liquids into each separate glass. Put a candy cane into each glass and put a timer on. As the time goes on, observe</p>	

	<p>what happens to each candy cane. Which candy cane will dissolve the fastest? Children could draw pictures of what each candy cane looks like after 20 minutes!</p>	
<p>Day 5</p>	<p>The 5th challenge is 'Festive Lantern Making'. You will need: 4 sticks of the same length, 6 slightly shorter sticks of the same length, tape, string, a tea light candle, 4 bits of tissue paper, PVA glue, paintbrush, decorations. You need create two triangles using the sticks. You need to tape together 2 long sticks and 1 short stick per triangle. You need to then attach the triangles together at the top using tape. Using the last two small sticks, create a square base, connecting the other two small sticks together. Use the last two small sticks to create a cross for the candle to sit on in the square base. Get the bits of tissue paper and one buy one, cover them in the PVA glue. Then place the sheets over the lantern stand that you have just made. You can then decorate it and light you candle to see how it looks!</p>	
<p>Day 6</p>	<p>The 6th challenge is 'Magic Images' to trick your eyes! Have a look at the images and see how your eyes can trick you. <b>Method 1:</b> Hold the centre of the printed image right up to your nose. It should be blurry. Focus as though you are looking through the image into the distance. Very slowly move the image away from your face until it starts to give a 3-D effect. Once you perceive the hidden image and depth, you can look around the entire 3D image. The longer you look, the clearer the illusion becomes. The farther away you hold the page, the deeper it becomes. <b>Method 2:</b> Look at a very distant object, keep looking there as you bring the picture up into your line of vision at comfortable viewing distance (experiment with this distance). Your eyes should refocus but (hopefully) not converge unless you concentrate. Method 3: Look at the image, try to reflect a distant object in the shiny surface of the image. Look at the distant object and then into the image. <b>Method 4:</b> Try this first reading a book. Imagine that it is late and that you are tired. Let your eyes relax and you should and that you now have two blurred images of the page, as you relax more the images move further apart. Now try this with the magic picture. Resist the urge to focus on any one bit of the image. As soon as you begin to get a sort of 3-D effect, go carefully! Once you've got the idea, you'll that you can look</p>	



	<p>around inside the image! It's quite a queer experience!</p>	
<p>Day 7</p>	<p>The 7th challenge is creating your own online advent calendar using computing skills. You will need to follow this link to complete it:  <a href="https://makecode.microbit.org/">https://makecode.microbit.org/</a></p>	
<p>Day 8</p>	<p>The 8th challenge is a Poster Competition. Children are to draw and label a poster to show what Mars will look like if people start to live there!</p>	
<p>Day 9</p>	<p>The 9th challenge is 'Fizzling Christmas Trees'!  You will need:  Sodium Bicarbonate, vinegar, tap water, food colouring (for decoration), bowl, spoon, ice cube tray, washing up liquid  To do this you put the Bi Carb into the ice cube tray to see how much you need. In a separate bowl, mix this bi carb with water and food colouring to create a slightly runny paste. Pour this into the mould and you can add sequins or glitter as decorations if you want! Put this into the freezer for a few hours or ideally overnight. When it has frozen, put it into a bowl and decorate further if you want. Put some washing up liquid around it in the bowl. Squirt some vinegar on and watch it fizz!</p> <p>What happens if you put more or less vinegar on?</p>	
<p>Day 10</p>	<p>The 10th challenge is Making Christmas Decorations from Milk!  You will need:  1 cup of milk, vinegar, food colouring, water, bowls, spoons, sieve, cookie cutters, straw  Warm the milk in a bowl in the microwave for roughly 90 seconds. Pour four tablespoons of vinegar into the milk. Stir the mixture and lumps should start to form. Pour the lump mixture (white lumps with a watery looking liquid) into a sieve to get rid of the liquid. Use a spoon to squish the lumps into the sieve to get rid of excess water. Now pour water in to continue to get rid of the other liquid. Put the lumpy mixture into a bowl and add the food colouring. Mix it with your hands. Put the coloured lumpy mixture into the</p>	

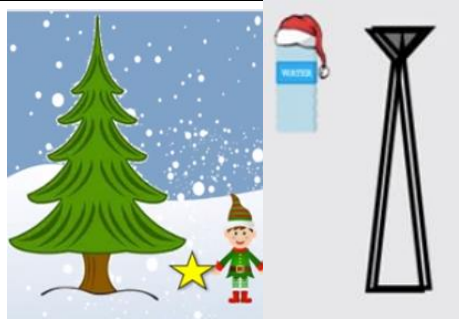
	<p>cookie cutter and put a cm of straw through the top. When it has dried, you can decorate it!</p>																					
<p>Day 11</p>	<p>The 11th challenge is a 'Toothpaste Challenge'! Santa needs toothpaste but the shops are shut – let make him some homemade toothpaste instead!          You will need:          3 teaspoons of baking soda (not baking powder), 1 teaspoon of cornflour, Half a teaspoon of salt, 3 teaspoons of glycerine, 1-2 teaspoons peppermint flavouring, food colouring (optional), 2-3 teaspoons of water.          Mis together the baking soda, cornflour and salt in a container. Add the glycerine and peppermint flavouring and mis together to form a thick paste. Ass a few drops of water at a time until the mixture is at the correct thickness. Add food colouring to your new toothpaste! You can then test your toothpaste by drawing something in felt tip and seeing if your toothpaste will remove it. Does it remove stains?</p>																					
<p>Day 12</p>	<p>The 12th challenge is 'Crack the Reindeer Code'! Children need to crack the code to draw the three different reindeers described!          Use the mRNA code to help crack the name, eye colour, nose colour, antler length and coat colour of each reindeer. Then draw a picture of the three reindeers!</p>	<p>See the bottom of this document to see the codes for the three different reindeers and how to crack it!</p> <table border="1"> <thead> <tr> <th>Reindeer name</th> <th>Eye colour</th> <th>Nose colour</th> <th>Antler length</th> <th>Coat colour</th> </tr> </thead> <tbody> <tr> <td>CCCCGAGCAUUGUGAGAGA</td> <td>GGGCUGAGAGAAU</td> <td>UUUGCAUGGAC</td> <td>ACGGCCUUCUC</td> <td>CUGAUCGGGCACCC</td> </tr> <tr> <td>GAGCAUCUCACGACGU</td> <td>UUGGCGGAGCUAUGGACUC</td> <td>AGAGAGAU</td> <td>UCCAUAGCCUACUG</td> <td>GACGCGUAAA</td> </tr> <tr> <td>GAGCCACUCUGUGGCCG</td> <td>ACUGCGAAU</td> <td>GAUGCCAGAAA</td> <td>ACCGCUCUACUA</td> <td>CUAAUUGGCCACACG</td> </tr> </tbody> </table> <p>Starting with this code          ACAGAAUCGACC          Split into groups of 3          ACA GAA UCG ACC</p> <p>Read the code from the diagram, starting from the corner (1<sup>st</sup> letter), then next ring (2<sup>nd</sup> letter) and then the next ring (3<sup>rd</sup> letter). This will tell you the amino acid name and the one letter code (letters around the very edge)</p>  <p>Code image credit: J Alvas  <a href="https://www.researchgate.net/publication/300326666/genetic-code-9th-ed">https://www.researchgate.net/publication/300326666/genetic-code-9th-ed</a></p> <p>We have designed this activity so that the one letter codes spell a word!          ACA GAA UCG ACC          T E S T</p> <p>View looking South mid-evening, mid-December          Cassiopeia, Cygnus, Lacerta, Vulpecula, Delphi, Equuleus, Pegasus, Square of Pegasus, Pleiades, Uranus, Antares, Triangulum, Andromeda Galaxy, Abhanta</p>  <p>Pause</p> <p>To hear about star gazing during December click on the telescope          For a transcript of the blog click on the star</p>	Reindeer name	Eye colour	Nose colour	Antler length	Coat colour	CCCCGAGCAUUGUGAGAGA	GGGCUGAGAGAAU	UUUGCAUGGAC	ACGGCCUUCUC	CUGAUCGGGCACCC	GAGCAUCUCACGACGU	UUGGCGGAGCUAUGGACUC	AGAGAGAU	UCCAUAGCCUACUG	GACGCGUAAA	GAGCCACUCUGUGGCCG	ACUGCGAAU	GAUGCCAGAAA	ACCGCUCUACUA	CUAAUUGGCCACACG
Reindeer name	Eye colour	Nose colour	Antler length	Coat colour																		
CCCCGAGCAUUGUGAGAGA	GGGCUGAGAGAAU	UUUGCAUGGAC	ACGGCCUUCUC	CUGAUCGGGCACCC																		
GAGCAUCUCACGACGU	UUGGCGGAGCUAUGGACUC	AGAGAGAU	UCCAUAGCCUACUG	GACGCGUAAA																		
GAGCCACUCUGUGGCCG	ACUGCGAAU	GAUGCCAGAAA	ACCGCUCUACUA	CUAAUUGGCCACACG																		
<p>Day 13</p>	<p>The 13th challenge is 'Star Gazing'!          Follow this link for guides on how to star gaze this December!  <a href="https://thestemhub.org.uk/xmas-2020/13mkvdmflkv-day-13/">https://thestemhub.org.uk/xmas-2020/13mkvdmflkv-day-13/</a></p>	 <p>Pause</p> <p>To hear about star gazing during December click on the telescope          For a transcript of the blog click on the star</p>																				
<p>Day 14</p>	<p>The 14th challenge is a story about the night before Christmas. Follow the link to hear the story!  <a href="https://thestemhub.org.uk/xmas-2020/14vgcdshdc-day-14/">https://thestemhub.org.uk/xmas-2020/14vgcdshdc-day-14/</a></p>																					

**Day 15**

The 15th challenge is a 'tree tower' challenge! Children need to design a tower for the elves to climb so that they can put the star on the 1-meter tall Christmas tree.

You will need:  
 10x sheets of A4 paper, Sellotape, scissors, a tape measure and a 500g mass (500ml water bottle) to test.

The rules:  
 Your tower must be:  
 Free standing,  
 be able to support 500g mass (water bottle),  
 be at least 1 meter tall,  
 have a platform at the top for the elf to stand on,  
 be made from paper and sellotape **only**,  
 not be attached to the floor/table/chair.  
 You can cut or fold the paper however you wish!  
 Once you've constructed your tower, see if you can balance your elf (water bottle) on top!



**Day 16**

The 16th challenge is a 'density' challenge!

You will need:  
 A mixture of different liquids around the house and a glass to pour them in!  
 For example: washing up liquid, oil, water (with food colouring if wanted), vinegar, honey.

The idea for this is that the children experiment making a density tower. They need to try to pour the liquids into the glass in different orders to try to make them sit on top over each other. Which liquids work best and in which order?



**Day 17**

The 17th challenge is a Christmas word search.

Go to the bottom of this document to find the word search bigger.

**Word Search** Click on each letter of the word

Brain	Career	Cells	Christmas	Communication	Giving	Idea	Computer	Construction	Covid							
Creativity	Engineering	Future	Robotics	Science	Solving	STEM	Teamwork	Technology	Thinking							
A	T	H	I	N	K	I	N	G	K	R	O	W	M	A	E	T
S	B	D	G	K	N	O	I	T	C	U	R	T	S	N	O	C
J	T	R	M	I	S	C	H	R	I	S	T	M	A	S	O	O
G	E	C	A	R	E	E	R	S	B	S	G	V	N	V	M	M
N	C	E	T	I	J	L	C	C	L	Z	O	O	I	W	E	M
I	H	R	H	C	N	L	S	R	E	A	W	D	R	A	D	U
R	N	U	S	A	H	S	R	E	T	U	P	M	O	C	I	N
E	O	T	S	U	S	C	E	A	H	N	D	E	B	E	C	I
E	L	U	O	G	F	J	S	T	H	T	C	T	O	N	I	C
N	O	F	L	S	D	L	E	I	T	N	E	G	T	W	N	A
I	G	I	V	I	N	G	A	V	E	A	Y	C	I	M	E	T
G	Y	A	I	D	D	E	R	I	E	N	I	C	A	V	I	
N	S	H	N	E	M	A	C	T	T	E	N	N	S	Z	S	O
E	P	I	G	A	N	S	H	Y	S	O	S	T	E	M	A	N

Medicine  
Research  
Sleigh  
Snow  
Solving  
STEM  
Teamwork

**Day 18**

The 18th challenge is a 'Chocolate Christmas Tree'!






You will need:  
 Some chocolate, hot water, a plastic sandwich bag that can be sealed, a mould (ice cube tray), scissors.

Put some chocolate in the plastic bag and put it in the hot water. The chocolate should melt. When it has melted, take the bag out and carefully cut on of the bottom corners of the bag. This should allow you to squeeze the chocolate out.

On parchment paper, squeeze the chocolate out into a 'flower shape'. Do this lots of times, remembering to decorate each one with sprinkles and wait for them to harden. When they are solid, stack them up on top of each other to create your tree! You will need to 'glue' them together using more melted chocolate!





<p>Day 19</p>	<p>The 19th challenge is about a different kind of light!          You will need a television remote control and a phone with a camera on.          Children need to use the phone camera in order to see the infra-red light coming from the tv controller.          Point the TV controller at the phone camera and press any button. The children need to be looking at the phone screen (whilst the camera is on) to be able to see the infra-red light.</p>	
<p>Day 20</p>	<p>The 20th challenge is a Christmas Sudoku!           Go to the bottom of this document to find the sudoku bigger!</p>	
<p>Day 21</p>	<p>The 21st challenge is all about gold, myrrh and frankincense.          Children research information about gold, myrrh and frankincense. What's the same? What's different?          How are they made/found?          What's the most interesting fact about each one?</p>	
<p>Day 22</p>	<p>The 22nd challenge is 'Christmas Music'!          You will need:          One wire coat hanger, two pieces of string (about 50cm long), a metal spoon.          Tap the spoon on the coat hanger and listen to the sound. Now tie the string to the coat hanger as seen in the picture. Wrap the other ends of the string around your fingers and then put your fingers in your ears. Get someone else to tap the coat hanger with the spoon – is the sound different? Why is that?</p>	
<p>Day 23</p>	<p>The 23rd challenge creating a sleigh for Santa to fly in.          You will need:          Paper, pens to decorate.          Can you create Santa a new sleigh? It could look a bit like a paper airplane. You will need to decorate it to look like Santa's sleigh.          You could use a mini toy to go in it to see how long you can get it to fly for. Remember his is hopping from house to house, so doesn't need to be flying for long periods of time all the time!</p>	

Day 24

The final challenge before Christmas is all about Vaccines.  
 Watch the video to learn more about Vaccines!  
<https://thestemhub.org.uk/xmas-2020/24fhgasfd-day-24/>  
 It gives lots of information about Covid and the current times we're in.  
 This link gives more information about vaccines.  
<https://elearning.pfizer.co.uk/superbugs/viruses-and-pandemics-ks2/>



**Day 12 code cracking!**

Reindeer name	Eye colour	Nose colour	Antler length	Coat colour
CCCCGAGCGAAUUGUGAGAGA	GGGCGUGAAGAGAAU	UUUGCAUGGAAC	ACGGCCCUUCUC	CUGAUCGGGCACACC
GACGCAUCUCACGAACGU	UGUGCGCGAGCUAUGGAACUC	AGAGAGGAU	UCCAUGGCCCUACUG	GACGCGCGUAAA
GACGCCAACUGUGAGCGC	ACUGCGAAU	GAUGCCAGAAAA	ACCGCUUACUA	CUAAUUGGCCACACG

Starting mRNA code

Split into groups of 3

Read the code from the diagram, starting from the centre (1<sup>st</sup> letter), then next ring (2<sup>nd</sup> letter) and dark blue ring (3<sup>rd</sup> letter). This will tell you the amino acid name and the one letter code (letters around the very edge)

Codon image credit: J Alves  
<https://openclipart.org/download/95203/genetic-code-RNA.svg>

We have designed this activity so that the one letter codes spell a word to help you draw your reindeer!

ACAGAAUCGACC

ACA GAA UCG ACC

ACA GAA UCG ACC

T E S T

Day 17 Christmas Word Search

# Word Search

Click on each letter of the word

Brain Career Cells Christmas Communication Computer Construction Covid  
 Creativity Engineering Future Giving Idea Maths Medicine Technology

A	T	H	I	N	K	I	N	G	K	R	O	W	M	A	E	T
S	B	D	G	K	N	O	I	T	C	U	R	T	S	N	O	C
J	T	R	M	I	S	C	H	R	I	S	T	M	A	S	O	O
G	E	C	A	R	E	E	R	S	B	S	G	V	N	V	M	M
N	C	E	T	I	J	L	C	C	L	Z	O	O	I	W	E	M
I	H	R	H	C	N	L	S	R	E	A	W	D	R	A	D	U
R	N	U	S	A	H	S	R	E	T	U	P	M	O	C	I	N
E	O	T	S	U	S	C	E	A	H	N	D	E	B	E	C	I
E	L	U	O	G	F	J	S	T	H	T	C	T	O	N	I	C
N	O	F	L	S	D	L	E	I	T	N	E	G	T	W	N	A
I	G	I	V	I	N	G	A	V	E	A	Y	C	I	M	E	T
G	Y	A	I	D	D	E	R	I	E	N	I	C	C	A	V	I
N	S	H	N	E	M	A	C	T	T	E	N	N	S	Z	S	O
E	P	I	G	A	N	S	H	Y	S	O	S	T	E	M	A	N

Research Thinking  
 Robotics Vaccine  
 Science  
 Sleigh  
 Snow  
 Solving  
 STEM  
 Teamwork



Day 20 Sudoku