

Bubble Challenges

Can you blow a bubble...

- ... bigger than your head?
- ... within a bubble?
- ... on top of another bubble?
- ... that doesn't pop when you catch it with your hands?

CREATED BY



PROUDLY PRODUCED BY



ADAPTED IN PARTNERSHIP WITH



© 2012-2025, The University of North Carolina at Chapel Hill. All rights reserved.
Permission is granted to duplicate for educational purposes only.

Build a Cell

Supplies

- 1 plastic bag
- 1 plastic capsule
- 6 pipe cleaners

Note

Different animals and plants have different numbers of chromosomes:

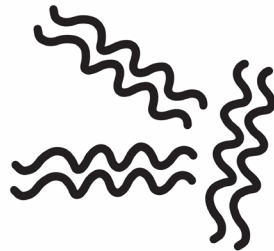
- Humans have 23 pairs
- Carrots have 9 pairs
- Mosquitos have 3 pairs
- Giraffes have 31 pairs
- Adder's Tongue ferns have 630 pairs!

What to do

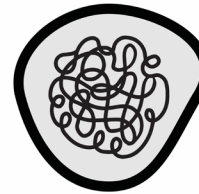
1. The plastic bag will represent the outer lining of the cell. Use a marker to label it "cell membrane".
2. The plastic capsule will represent the brain or boss of the cell. Use a marker to label it "nucleus". The nucleus of a cell holds all the instructions for the cell to do its job.
3. The pipe cleaners will represent the chromosomes of the cell. The cell's instructions are located in DNA which is found in genes that are linked together in long structures called chromosomes. This is the genetic material for the cell.
4. Arrange the pipe cleaners in pairs on the table. Chromosomes come in sets of two, one from the biological mother and one from the biological father. This is how traits or characteristics are passed on.
5. Twist the chromosome pairs in a spiral around your finger or a pencil. In order to fit into the nucleus, the genetic material is in a special shape or form - a spiral shape called a helix.
6. Place the chromosomes inside the nucleus.
7. Place the nucleus inside the cell membrane.

? What type of cell did we make?

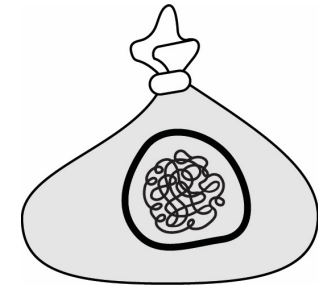
Chromosomes



Nucleus



Cell Membrane



CREATED BY



PROUDLY PRODUCED BY



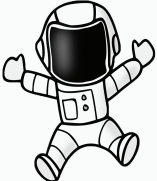
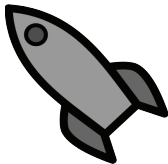





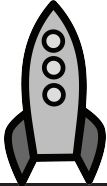


ADAPTED IN PARTNERSHIP WITH



© 2012-2025, The University of North Carolina at Chapel Hill. All rights reserved. Permission is granted to duplicate for educational purposes only.

Cosmic Coding

Use the Coding Symbols to write the code that takes the astronaut to each space ship and then back to Earth. Be sure to avoid the asteroids!

Fun Fact:
When you put all the coding symbols together you have an Algorithm!

Coding symbols



One space to the right



One space to the left



One space up



One space down

In the spaces below, write the code to get the astronaut to...

First Space Ship:

Second Space Ship:

Third Space Ship:

Earth:

Fun Challenge:
Can you write an Algorithm with the smallest number of coding steps?

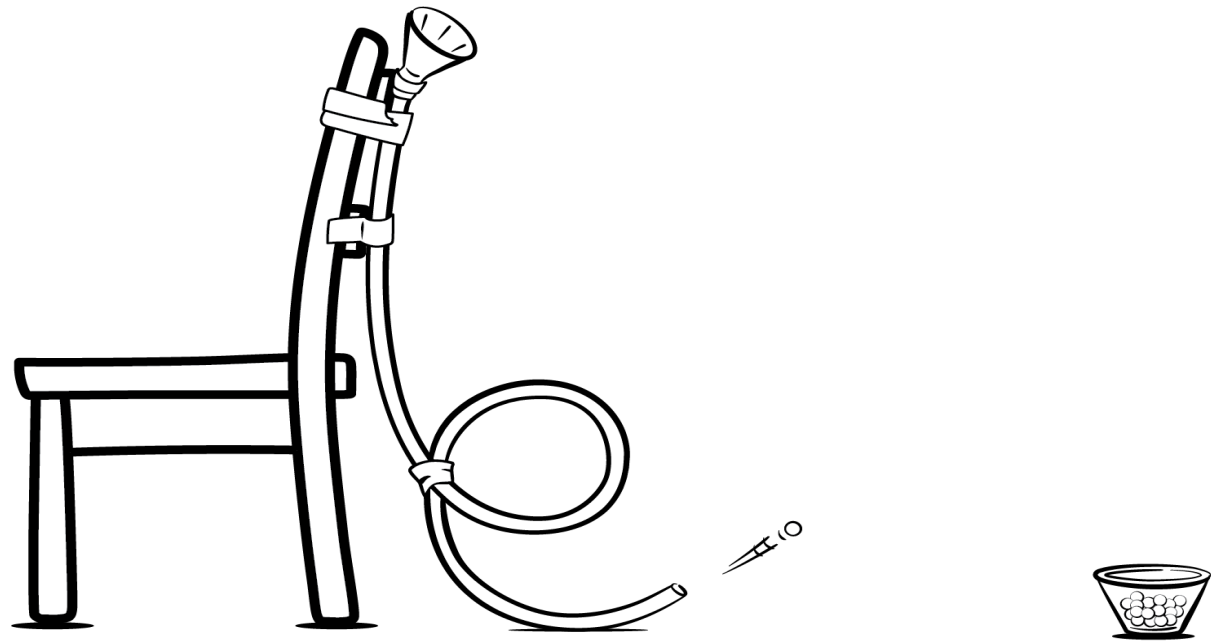
Create-a-Coaster

Supplies

- plastic tubing
- cone-shaped paper cup
- plastic cups
- masking tape
- small marbles

What to do

1. Use masking tape to attach one end of a piece of plastic tubing to a wall (about 3-4 ft. up from the floor) or to the back of a chair, and create a coaster for your marbles.
2. Use a cone-shaped paper cup as a funnel to drop the marbles into the tubing.
3. Position a plastic cup to catch the marble as it reaches the end of the track.
4. What other designs can be made using these same materials?



CREATED BY



PROUDLY PRODUCED BY



ADAPTED IN PARTNERSHIP WITH



© 2012-2025, The University of North Carolina at Chapel Hill. All rights reserved.
Permission is granted to duplicate for educational purposes only.

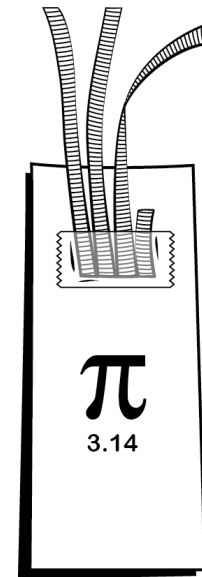
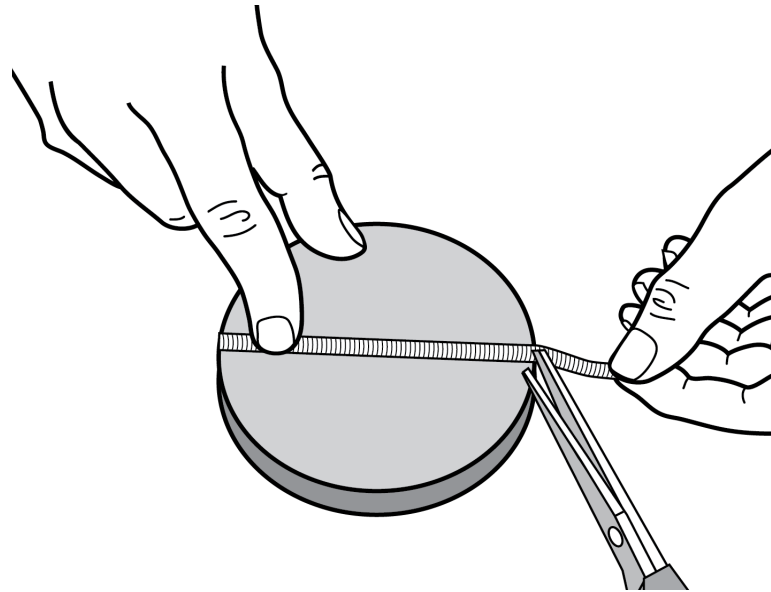
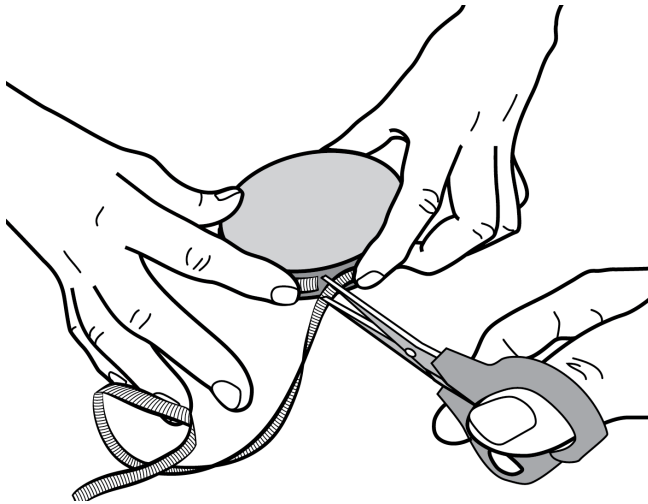
Easy as Pi

Supplies

- circular template
- ribbon
- scissors
- bookmark template
- tape

What to do

1. Carefully wrap the ribbon around the outside of your circular object. It may be easier if you have a partner help you. Cut the ribbon. It is now the length of the circumference of the object.
2. Hold one end of the “circumference” ribbon on the circular object, stretch the other end of the ribbon across, and cut the ribbon so it is now the length of the diameter of the object.
3. Repeat this and cut as many “diameter” ribbons from the “circumference” ribbon as you can. Then count all the whole (and any partial) pieces of ribbon.
4. Tape the diameter ribbons to the bookmark template.



CREATED BY



PROUDLY PRODUCED BY



ADAPTED IN PARTNERSHIP WITH



© 2012-2025, The University of North Carolina at Chapel Hill. All rights reserved. Permission is granted to duplicate for educational purposes only.

Galilean Cannon

Supplies

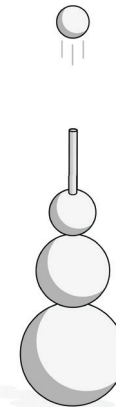
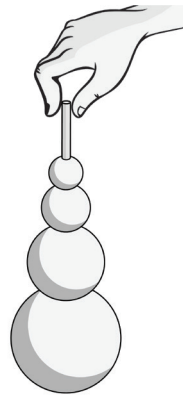
- a stack of balls (known as a seismic accelerator)
- safety glasses

SAFETY NOTE

In this activity, the top ball can shoot off at high speeds! Be sure you wear the safety glasses when using the seismic accelerator - or are at a safe distance when the balls are dropped.

What to do

1. Hold the bouncy ball between two fingers, stretch out your arm, and observe the height of the ball.
2. Release the ball so that it drops and strikes the ground.
3. Observe how high the ball bounces relative to the original height of the ball.
4. Add the bouncy ball to the top of the seismic accelerator.
5. Hold the top of the seismic accelerator contraption between two fingers, stretch out your arm, and observe the height of the top ball.
6. Release the entire contraption. Stand back - the top ball can shoot into the air at high speeds!
7. Compare how high the ball bounced when it was on the stack versus not on the stack.



CREATED BY



PROUDLY PRODUCED BY



ADAPTED IN PARTNERSHIP WITH



© 2012-2025, The University of North Carolina at Chapel Hill. All rights reserved. Permission is granted to duplicate for educational purposes only.

Garden In A Glove

Supplies

- 1 disposable glove
- 1 permanent marker
- 5 cotton balls
- water
- 5 different seeds
- 1 craft stick
- 1 twist tie

What to do

1. Use a permanent marker to write the names of the 5 seeds on the fingers of the glove (one type per finger).
2. Dip a cotton ball in water and gently wring it out.
3. Place 1-2 seeds of the same type in the wet cotton ball.
4. Put the cotton ball in the finger of the glove that is labeled with that seed name. You may need to use a craft stick to push the cotton ball down to the bottom.
5. Repeat this process for the remaining 4 kinds of seeds.
6. Gently blow a little air into the glove and close the twist tie around the top to keep the air from escaping.

When you get home:

1. Keep the glove in a warm place until the seeds germinate.
2. Once the seeds have sprouted and leaves begin to appear, hang the glove in a sunny window.
3. When your seeds have roots, you can plant them in a container using potting soil.
4. Cut the finger off the glove and throw away the plastic. If you can't separate the roots from the cotton, plant the cotton and seeds/ roots together in potting soil.
5. Watch your garden grow!

What's Happening?

Each seed contains a baby plant and food for initial growth.

Most seeds only need water and a warm place to begin to grow. Seeds have their own food stored inside of them, a tissue rich in starch and protein called endosperm, so they do not need sunlight or nutrients from soil until they have sprouted and developed roots.

The seeds will germinate (begin to grow/sprout) in about 5 to 7 days.

Transplant (remove and plant in another place) the seeds after about 14 days by cutting the tips off the fingers of the glove.

Take the seedling out of the plastic and place the cotton ball and germinated seeds into a small pot or cup of soil.

CREATED BY



PROUDLY PRODUCED BY



ADAPTED IN PARTNERSHIP WITH



© 2012-2025, The University of North Carolina at Chapel Hill. All rights reserved. Permission is granted to duplicate for educational purposes only.

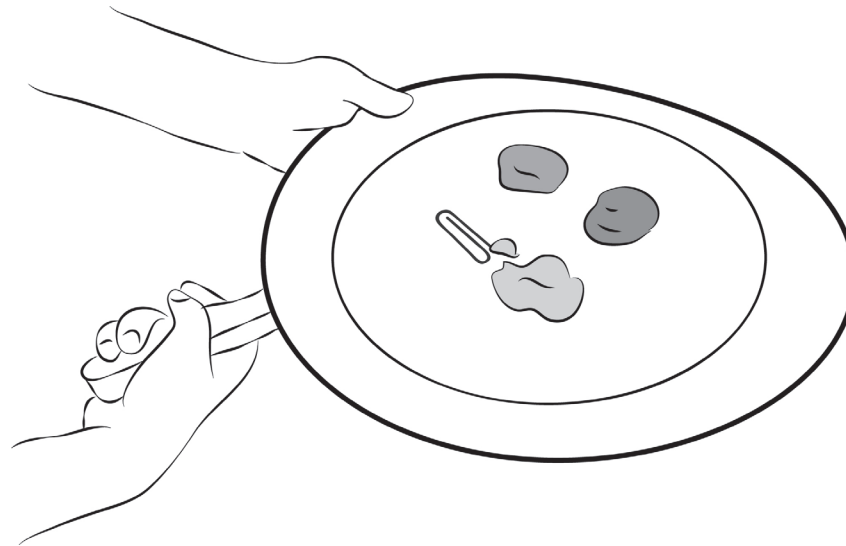
Magnetic Painting

Supplies

- 1 paper plate
- washable paint
- metallic objects
- 1 magnetic wand

What to do

1. Write your name on the paper plate.
2. Have an adult place 2-4 dime sized drops of paint on the plate – if you place too much paint on the plate it will get soggy and floppy.
3. Place one or more metal objects on your plate.
4. Hold the plate with one hand and hold the magnetic wand under the plate with the other hand. You can have a friend or a parent hold the plate for you.
5. Move the wand around slowly to drag the objects through the paint.
6. Observe the interaction of the objects and the magnetic wand as you create your masterpiece!



CREATED BY



PROUDLY PRODUCED BY



ADAPTED IN PARTNERSHIP WITH

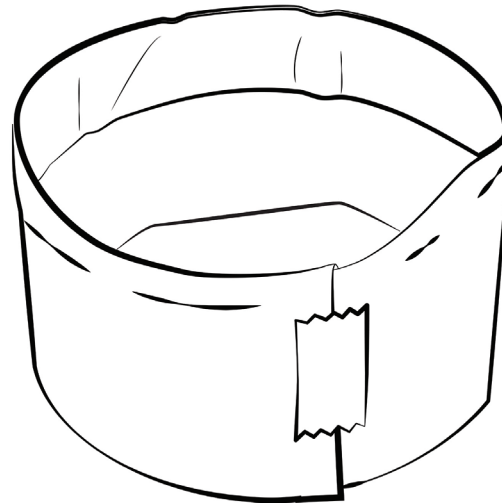
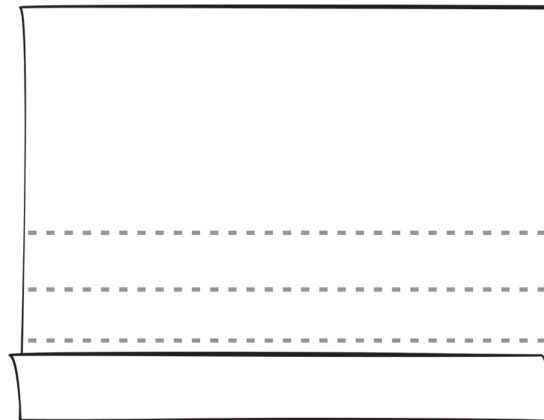


© 2012-2025, The University of North Carolina at Chapel Hill. All rights reserved.
Permission is granted to duplicate for educational purposes only.

Ring Gliders

What to do

1. Hold your half sheet of paper in front of you “hot dog” style.
2. Fold up the bottom edge about 1/2 of an inch to make the nose of your ring glider.
3. Fold up this edge three more times. Make sure your folds are tight!
4. Roll your sheet of paper into a ring. Put one end of the folded edge into the other and tape to hold the ring into place.
5. The glider is ready to fly! Play catch, try to hit a target or see how far your ring can glide.



For the best throw, hold your ring with the folded nose facing forward. Gently toss it underhand and watch it glide!

CREATED BY



PROUDLY PRODUCED BY



ADAPTED IN PARTNERSHIP WITH



© 2012-2025, The University of North Carolina at Chapel Hill. All rights reserved. Permission is granted to duplicate for educational purposes only.

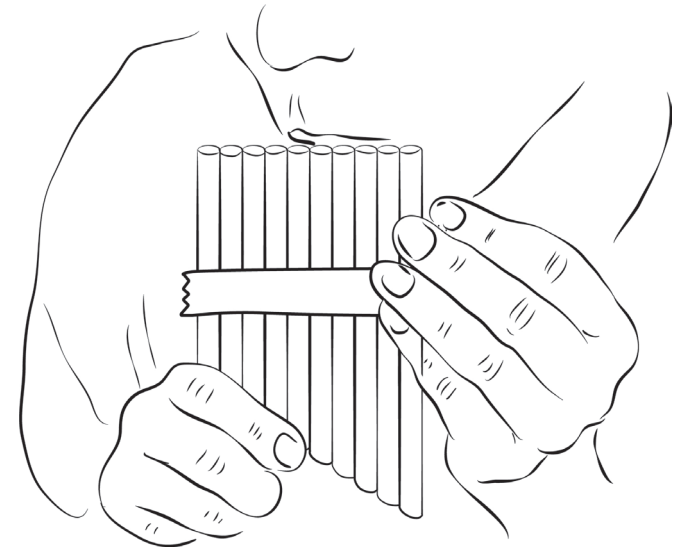
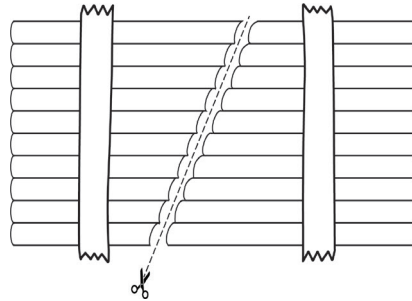
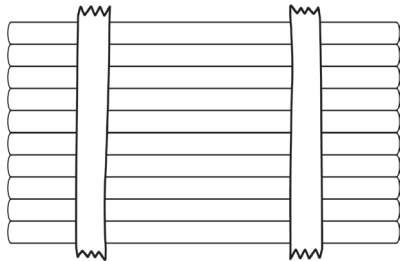
Straw Flutes

Supplies

- 10 straws
- masking tape

What to do

1. Get a partner to work with if you can.
2. Select 10 straws and line them up evenly.
3. Wrap masking tape around the straws near each end.
4. Have an adult use the scissors to cut diagonally through all 10 straws.
5. You will now have 2 straw flutes – one for each partner!



Test your flute

- Blow across the tops of the straws, not directly into them.
- Do you hear a difference when you blow across the shorter straws versus the longer straws?
- Can you could play a song such as “Twinkle, Twinkle, Little Star”?

CREATED BY



PROUDLY PRODUCED BY



ADAPTED IN PARTNERSHIP WITH



© 2012-2025, The University of North Carolina at Chapel Hill. All rights reserved.
Permission is granted to duplicate for educational purposes only.