

WonderFest Activity Station Descriptions

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Once you've selected your WonderFest Topic, choose from the listed activities according to the size of your event. For example: If you've chosen a Small WonderFest you should pick three activities from your selected topic. See the table: WonderFest Size, # of Activity Stations and Fees for details on size and number of activities.

Engineering

1. Boats

- How can ships be so heavy and still float? In this activity participants will make and test their own boats to understand water displacement and buoyancy.

2. Build Your Own Bubble Wand

- What shape is a bubble if your wand is a circle? What shape is a bubble if your wand is a square? With provided materials, participants will make their own bubble wands and learn why bubbles are typically one shape.

3. Gear:

- If you've ever seen the mechanism of a clock you have seen interlocking gears. Make your own gears and learn how the turning force is transferred between gears.

4. Paper Airplanes

- We have all played with paper airplanes before. But how do they actually fly? In this activity, participants will make their own paper airplane and learn how thrust, drag and gravity make the airplane fly... or fall to the ground.

5. Paper Roller Coasters

- You've heard that energy can't be created or destroyed, but what does that really mean? Create your own roller coaster to see how the energy of marbles are conserved by transforming potential energy into kinetic energy.

6. Rube Goldberg Machines

- Do you enjoy following the path of a marble along a complicated track? Using different materials, participants will make a complex path for a marble to move through while learning about Rube Goldberg Machines.

7. Scribble Bots

- Hey! Don't scribble, color in the lines! Not with these robots. Can you make a robot that makes scribble art?

8. Stomp Rockets

- Ready for take-off with the stomp rockets experiment! Participants will build their own rocket and launch it high into the air.

9. Wind Turbines

- How do wind turbines transform wind into usable energy? Create your very own 'wind turbine' and learn the process by which wind turbines can power our homes.

10. Ziplines

- How can a string and pulley help rock climbers down a mountain? With this activity participants will learn how ziplines work by designing, testing, and improving their own models.

Explore Earth and Space

1. Craters

- Ever noticed how lumpy the moon looks? Those lumps are craters! What causes them? In this activity, participants will make their own craters, and learn how they are created!

2. Exoplanet Transits

- How do scientists find other planets in our universe? How do they know the size of those planets? With this activity, participants will observe what happens when objects block light and cast shadows, one of the methods scientists use to identify planet size!

3. Expanding Universe

- Bang! The universe is continuously expanding, but what does that look like, and how does it work? With a group of four, participants will use the tools provided in this activity to see how the universe is expanding!

4. Filtered Light

- Have you ever been looking out the car window just to have the sun shine directly in your eyes? Did you reach for your sunglasses to blot out the brightness? With this activity, participants will learn how different filters affect light, and in what way astronomers use them to view the universe!

5. Hide & Seek Moon

- Is that a man in the moon, or a cow? What can you spot on the moon? Using binoculars, participants will observe a poster of the moon and seek out ten different animals that are hidden among the image!

6. Land Cover

- How does water affect land? Erosion can happen naturally and slowly, or very quickly due to human impact. In this activity, participants will understand how different landscapes are affected by water and erosion.

7. Magnetic Fields

- Location, location, location! Can you locate the magnetic fields of different celestial bodies? In this activity, participants will use the probe tool to find magnetic fields on the model planetary bodies.

8. Mars Rovers

- Ground control to Major Tom! In this activity, two participants will act as different roles; one will play Mission Control and the other a Mars rover! Mission Control will give the Mars rover (who is blind folded) directions to navigate the Mars landscape. Can you work together and avoid the obstacles?

9. Objects in Motion

- Can you balance the Playdough planets? What happens when one is bigger than the other? With this activity, participants will explore how orbiting works with objects in our universe!

10. Observe the Sun

- Using a solarscope, participants can explore what the Sun looks like! This activity allows the Sun to be safely viewed. What do you notice about it?

11. Pack a Space Telescope

- Don't forget your telescope! With this engineering-oriented activity, participants will build their very own space telescope. Make sure it fits in the container so you can take it to space!

12. Paper Mountains

- Mountains are majestic and beautiful! If you are camping at the base of one, however, you may want to know more about the way rain storms affect that area. With the paper mountains experiment, participants can observe how gravity and land formations impact the flow of water to certain areas!

13. Pocket Solar System

- My very educated mother just...just what? Having a hard time remembering the planets in the solar system? With this activity, participants get to create a pocket model of the solar system! Never forget what planet comes after Jupiter again.

14. Rising Sea

- With this experiment, participants will observe coastal sea-level rise. Explore the different environmental effects causing this rise in sea-level and why it's important to track the changes on coastlines!

15. Space Guess Quest

- With this space themed board game, participants will try to guess their partner's mystery space object using yes-or-no questions only! First one to guess correctly is the winner.

16. Static Electricity

- Ouch! Touching those pesky door handles during winter often results in a zap from static electricity. With this experiment, learn how static electricity is created, and build an electroscope, which can detect electrical charges!

17. Stomp Rockets

- Ready for take-off with the stomp rockets experiment! Participants will build their own rocket and launch it high into the air.

18. Temperature Mapping

- Explore how different surfaces absorb heat and learn how to read temperature maps! Do you know what the various colors of infrared mean?

Full STEAM Ahead

1. Balancing Bird

- How do we stay upright and balanced against the force of gravity? Can you learn the physics behind this with the balancing bird and try to find its center of gravity?

2. Binary Jewelry

- The language of computers is a versatile tool! In this activity, explore how Binary Code is used to program computers and robots, then make your very own coded jewelry to take home.

3. Color Changing Chemistry

- Acids and bases and the pH scale, oh my! Watch as an acid and base react with the pigments in goldenrod paper, and learn what the pH scale has to do with it all. Create a science-art masterpiece to take home!

4. Foam Sculptures

- What happens if you put shaving cream in a vacuum chamber and suck out the air pressure? Explore those outcomes with this colorful, bubbly activity!

5. Gravity Graph

- Physics and gravity meet art! The gravity graph shows the physical effects of gravity on an object in motion...and creates a really cool art piece!

6. Mobius Strips

- Math is a wonderful thing! This activity explores geometry. A normal sheet of paper has multiple sides and edges, but a mobius strip is non-orientable, meaning it has only one side and one edge! Build one and take it home.

7. Nature of Dye

- Ever wonder what makes ice cream different colors? What about make-up? Test out what happens to dye when you change its pH!

8. Rainbow Paper

- Why do oil spills look like rainbows on water? This activity explores thin film interference, the interaction between a film of oil on water that results in its rainbow sheen. Take home your very own rainbow!

9. UV Art

- What is fluorescence? In this activity, participants will create art pieces using various paints, and then observe what happens to the paint under a UV light. We will also explore how scientists use fluorescence to identify specific compounds on Earth!

10. Thaumatrope

- It's all an illusion! Thaumatrope originated as a toy in the 19th century with lots of cool science behind it. This activity shows the physics behind this optical illusion, and allows participants to make their very own thaumatrope toy.

Let's Do Chemistry

1. Atoms to Atoms:

- Ever played Apples to Apples? This chemistry version helps get participants excited about learning chemistry and build confidence in their knowledge of chemistry concepts.

2. Build a Battery:

- Can you build a battery and turn on the light bulb? With these materials you can! Learn about the flow of electrons and energy conversion with this experiment.

3. Chemistry is Colorful:

- What makes a black marker black? Are there different colors within various black markers? Using paper chromatography, participants will be able to see what happens when the ink of different black markers gets wet. The colors may surprise you.

4. Chemistry Makes Scents:

- Sometimes it's hard to tell what a specific scent is! With Chemistry Makes Scents, participants explore the differences and similarities shared on a molecular level of two mystery scents.

5. Molecules in Motion:

- What is air pressure doing to objects on Earth? If we vacuumed away that pressure, how would it affect certain objects? Find out with this vacuum chamber experiment.

6. Nature of Dyes:

- Ever wonder what makes ice cream different colors? What about make-up? Test out what happens to dye when you change its pH!

7. Rocket Reactions:

- With rocket reactions, participants will test what happens when water, baking soda, and citric acid are mixed together and confined in a test tube. Fire in the hole!

8. Sublimation Bubbles:

- In this experiment, participants will get to create bubbles filled with carbon dioxide gas as a result of dry ice heating up. This process, of going from a solid straight to a gas, is sublimation! Explore how these bubbles are different from standard bubbles.

9. What's in the Water?:

- What IS in the water? Participants will perform various experiments on two water samples to determine what properties make the samples different.

10. Zomes and Bubbles:

- Why do bubbles form as spheres? Is there a way to make a bubble not a sphere? Try your hand at working against nature by building 3D bubble wands to make differently shaped bubbles.

Tech Takeover

1. Penny Keyboard

- Can you play a keyboard? What about a keyboard made up of pennies? This activity explores circuits and sound! When you complete the circuit of the Makey Makey keyboard, it allows the bananas to be used as keys.

2. Binary Jewelry

- The language of computers is a versatile tool! In this activity, explore how Binary Code is used to program computers and robots, then make your very own coded jewelry to take home.

3. Brush Bots

- Can you build a robot? In this activity, participants will build and race the robots they make using various materials, including the head of a toothbrush.

4. Build a Battery

- Can you build a battery and turn on the light bulb? With these materials you can! Learn about the flow of electrons and energy conversion with this experiment.

5. Computer Cryptography

- Can you decode the secret message? Using binary code cryptography, explore the ways computers encode your private information to keep it safe!

6. Makey Makey Conductivity Test

- Complete the circuit! In this activity, participants will hold a “ground” object that completes the circuit, allowing the computer to register the flow of electricity. Some objects conduct electricity better than others. Test out which ones work best!

7. Mars Rover

- Ground control to Major Tom! In this activity, two participants will act as different roles; one will play Mission Control and the other a Mars rover! Mission Control will give the Mars rover (who is blind folded) directions to navigate the Mars landscape. Can you work together and avoid the obstacles?

8. Merge Cubes

- What’s up with this cube? Whoa! Look at it now! Using a virtual reality camera app on a tablet, participants will watch the Merge Cube transform from a patterned block to planets in space or museum artifacts! Explore VR with this cool activity.

9. Ozobots

- Ozobots are tiny robots coded to read color patterns. They can moonwalk, speed up, slow down, turn in all directions, and spin! With this activity, participants can draw obstacle courses for these little robots to complete.

10. Robot Bowling

- Meet Dash! Dash is a robot programmed to do many different tasks. In this activity, participants will give Dash programmed commands and see if they can knock down all of the bowling pins!

11. Scribble Bots

- Hey! Don't scribble, color in the lines! Not with these robots. Can you make a robot that makes scribble art?

12. Virtual Reality Adventures

- Explore the world of virtual reality with a series of apps that let you view the moon, human anatomy, and much more! By placing the WonderLab iPods into a VR headset, you can see things through a whole new lens.

The Science of Sound and Music

1. Penny Keyboard

- Can you play a keyboard? What about a keyboard made up of pennies? This activity explores circuits and sound! When you complete the circuit of the Makey Makey keyboard, it allows the bananas to be used as keys.

2. Explore Tuning Forks

- What all can you do with a tuning fork? In this activity, participants will hear the different frequencies of the tuning forks, as well as explore what the vibrations do when interacting with various mediums, like water, the table, or even your body!

3. Funky Chicken

- Is that a.....chicken? It sounds a bit funky. This activity explores how our vocal cords work to create sound. Just like the funky chicken, our vocal cords create vibrations.

4. It's the Sound Match Game

- Which two are the same?! With this activity, participants will try to decipher which shakers make the same sound. Notice how the vibrations caused by the different materials make various sounds!

5. Mini Pipe Organs

- Make a mini pipe organ! Once you've created your instrument, play it to better understand frequency. Participants will build knowledge about how the different vibrations through different sized mediums affects frequency.

6. Singing Glasses

- Pitch Perfect! The singing glasses all have a different frequency. Can you figure out why? This activity let's participants play the singing glasses and explore the frequency of sound.

7. Slinky Sound Waves

- How does sound travel? With this activity, the different types of sound waves are able to be seen in action.

8. Spoon Gongs

- Although spoon gongs look a little silly, they sure have a cool science behind them! With this activity, participants will delve deeper into the science of sound, and explore how vibrations traveling through different mediums results in different sounds.

9. Spouting Water Bowl

- The Spouting Water Bowl, or resonance bowl, is believed to have a history of over 2,000 years as a plaything for nobles during the Han Dynasty in China. Today, we can use it to explore which sound frequencies create waves and spouts.

10. You Too, Can Make a Kazoo

- Kazooey, kawhoey? Build a kazoo! With this activity, participants will get to make their very own kazoo and learn how it works!