California Science Center Field Trip Worksheet

Part 1: Disney Science Court in front of Creative World (2nd Floor)

**Coupled Pendulums:**
1. Why does one pendulum stop moving after a while? ________________

**Resonant Rings:**
1. What happens when you use low frequency? ________________
2. What do the levers on the side do to the rings? ________________

**Sea of Clouds:** Observe the fog in the cauldron.
1. What affects the motion of the fog other than your hand moving through it? ________________
2. What can you do to affect the fog? ________________

**Lariat Chain:**
1. What happens when you move the chain? ________________
2. What else is this chain like? ________________

**Echo Tube:**
1. How does the higher pitched sound vibrate? ________________
2. How does lower pitched sound travel in this echo tube? ________________
3. Which pitch do your ears hear first? ________________
4. Why does the echo start with a high pitched whine? ________________

**Expanding Hypar:**
1. The hypar changes in size from __________ to ________________
2. Who invented the hypar? ________________
3. What are the practical uses of a hypar? (meet the inventor) ________________
4. What are the two opposing forces working on the structure? 

Part 2: Creative World (2nd Floor)

Your Ears and Brain Work Together to Receive Sound:
1. What happens when you hear a sound?
2. Describe the cochlea

Stereo Sound All Around:
1. What is the difference between stereo sound and mono sound?
2. When sound is a little farther from one ear than the other, your brain

Bell:
1. What happens to the gas molecules when the bell rings?
2. What happens when you push button #1?
3. What happens once you have pushed button #2 and wait until gauge reads -1.0 then push button #1 again?
4. What is a medium?
5. What is the difference between sound traveling through a liquid and a gas?
6. Explain how sound starts.

Whisper Across the Room: You need two people to do this station.
1. A parabola directs
2. The parabola is the only shape that

Remote Control:
1. What is an LED?
2. What happens when you put your hand in front of the LED?
3. What turns the LED on and off?

**Resistor:**
1. What is a resistor?

**Camera:**
1. What stores energy from the battery?

**Mix Colors of Light:**
2. Why does colored light mix the way it does?

3. Why doesn’t paint mix like light does?

4. What color do you get when you have 80% red, 20% green and 70% blue?

**Energy Waves:**
1. What kind of energy is all around you?

2. Do each of the demos for this station:
   a. Which sample gave out the most gamma rays?
   b. Do any of the objects glow? If yes, which ones glow?

3. Match each type of wave to the correct description:
   - Gamma rays: about as long as a small virus
   - Visible Light: can be as long as a grain of salt
   - X-rays: about as long as a single atom
   - Radio waves: super-short; smaller than the smallest atom
   - Ultraviolet: 100 times smaller than a hair’s width
   - Microwaves: as long as three soccer fields
   - Infrared Waves: as long as a softball

**Light Table:** Do the demo for the light table.
1. What are the five ways to direct light?

**See in 3-D:**
1. What is a stereoscope?

**Look Inside Your Eye:**
1. What part of your eye focuses light on the retina?

**Energy Conservation:**
1. What is a watt?
2. What is the formula for power?______________________________
3. Which light bulb would you choose and why?__________________________

Use the computer to the right to help fill in the following:
1. Compact fluorescent light bulbs last up to _______ times longer and use up to _______ less energy.
2. Hot water makes up over _______ of all residential water uses.
3. _______ of your parent’s electric bill goes to powering your TV.

Try a Triangle:
1. What is a truss?__________________________________________

A Smoggy Day:
1. Where do the chemicals that cause smog come from?________
2. What traps smog in cities built near mountains?_______________

Part 3: Creative World (3rd Floor)

Run a Crash Test:
1. What are the ways to cushion a crash?________________________
2. In a crash your car________ before ______________________
3. Which of Newton’s Laws does the above statement pertain to?
   ____________(use your knowledge from class).

Pick the Right Bike:
1. Which material is the strongest, lowest in cost and lightest in weight?________________________
2. Which material would be the worst to use for a bike?________

Slice Through the Air:
1. Describe which shape works the best and why?________________
   _________________________________________________________
   _________________________________________________________

Make it Move:
1. What are the energy sources used for transportation?__________

Choose the Fuel: Answer the questions on the computer
1. What fuel can heat your home and help you get there?___________
2. You may have had this ingredient of this fuel for dinner?_________
3. What fuel can light a camp stove and propel a vehicle?__________
4. You may get a charge from the quiet ride you get from this fuel?
________________________________________________________

**Move It With Electricity:**
1. What does a battery need?____________________________________
___________________________________________________________

2. What happens with this demonstration?__________________________

**Get a Lift From Wings:**
1. _______ moving air in a shower lowers the _______ _________ inside and the curtain gets sucked in.
2. Air flowing _______ over a cyclist back _______ air pressure there, making a jacket puff out.
3. As _______ blows fast across the front of a sail it _______ the air pressure and _________ the boat forward.

**Get a Lift:**
1. What is lift?_______________________________________________

**Test Your Brakes:**
1. How do brakes work?_______________________________________
2. Which creates more friction rubber or polyethylene?_______________
3. Can a skid mark show a car’s speed?______________________________

**Part 4: Disney Science Court in front of World of Life (2nd Floor)**

**Cold Metal:**
1. The foam, wood, and metal squares are all at the same temperature, but why does metal feel colder?_______________________________

2. Foam is an insulator. That means it is a ______________________.
3. Metal is a ________________________________________________.

**No Sound Through Empty Space:**
1. What’s going on here?______________________________________
________________________________________________________

**Organ Pipe:**
1. How does the length of the tube relate to the sound you hear?_______
________________________________________________________

**Gaussian Melody:**
1. How do the steel balls and nails make music together?_____________

2. What does the word “Gaussian” refer to?________________________
Visible Effects of the Invisible:
1. What causes the splashing patterns you see?

2. What does varying the frequency of the sound waves do?

Skillets:
1. Which ones heat up faster?
2. Which ones heat up most evenly?
3. Explain why some heat up faster and more evenly than others.

Oscilloscope:
1. How are you able to see the string vibrations here?
2. How does the tension on the strings relate to the pitch you hear?

Geysers:
1. Can you predict when these geysers will blow up again?
2. What are the three phases of the geyser cycle?

Thermal Impressions:
1. Which way does heat flow?
2. How does the film work?

Water Spinner:
1. What is the surface of the spinning water?
2. What motion follows this curved path?

Water Standing on Air:
1. What two forces conspire to suspend the water?
2. Why doesn’t the water drop through the holes on the screen?

Confused Sea:
1. What creates ocean waves?

Liquid Mirror:
1. Why can’t you see anything above the water?

Vortex:
1. What creates a vortex?
2. How are the waves traveling?_______________________________
3. Give an example of this_____________________________________
   
**Air Rings:**
1. Water pressure does what with depth?___________________________
2. What creates air rings?______________________________________