

# Hands On! Discovery Center

## Tesla Experience Standards Alignment

### KINDERGARTEN

**K.ETS1.1:** Ask and answer questions about the scientific world and gather information using the senses.

**K.ETS2.1:** Use appropriate tools (magnifying glass, rain gauge, basic balance scale) to make observations and answer testable scientific questions.

### FIRST GRADE

**1.PS4.1:** Use a model to describe how light is required to make objects visible. Summarize how illumination could be from an external power source or by an object giving off its own light.

**1.PS4.2:** Determine the effect of placing objects made with different materials (transparent, translucent, opaque, and reflective) in the path of a beam of light.

**1.ETS1.1:** Solve scientific problems by asking testable questions, making short-term and long-term observations, and gathering information.

### SECOND GRADE

**2.PS4.2:** Use tools and materials to design and build a device to understand that light and sound travel in waves and can send signals over a distance.

**2.ETS2.1:** Use appropriate tools to make observations, record data, and refine design ideas.

**2.ETS2.2:** Predict and explain how human life and the natural world would be different without current technologies.

### THIRD GRADE

**3.PS1.1:** Describe the properties of solids, liquids, and gases and identify that matter is made up of particles too small to be seen.

**3.PS1.2:** Differentiate between changes caused by heating or cooling that can be reversed and that cannot.

**3.PS1.3:** Describe and compare the physical properties of matter including color, texture, shape, length, mass, temperature, volume, state, hardness, and flexibility.

**3.PS2.1:** Explain the cause and effect relationship of magnets.

**3.PS3.1:** Recognize that energy is present when objects move; describe the effects of energy transfer from one object to another.

**3.PS3.3:** Evaluate how magnets cause changes in the motion and position of objects, even when the objects are not touching the magnet.

**3.ETS2.1:** Identify and demonstrate how technology can be used for different purposes.

#### **FOURTH GRADE**

**4.PS3.1:** Use evidence to explain the cause and effect relationship between the speed of an object and the energy of an object.

**4.PS3.3:** Describe how stored energy can be converted into another form for practical use.

**4.PS4.1:** Use a model of a simple wave to explain regular patterns of amplitude, wavelength, and direction.

**4.PS4.2:** Describe how the colors of available light sources and the bending of light waves determine what we see.

**4.PS4.3:** Investigate how lenses and digital devices like computers or cell phones use waves to enhance human senses.

**4.ETS1.1:** Categorize the effectiveness of design solutions by comparing them to specified criteria for constraints.

**4.ETS2.2:** Determine the effectiveness of multiple solutions to a design problem given the criteria and the constraints.

**4.ETS2.3:** Explain how engineers have improved existing technologies to increase their benefits, to decrease known risks, and to meet societal demands (artificial limbs, seatbelts, cell phones).

#### **FIFTH GRADE**

**5.PS1.1:** Analyze and interpret data from observations and measurements of the physical properties of matter to explain phase changes between a solid, liquid, or gas.

**5.PS1.2:** Analyze and interpret data to show that the amount of matter is conserved even when it changes form, including transitions where matter seems to vanish.

**5.PS2.1:** Test the effects of balanced and unbalanced forces on the speed and direction of motion of objects.

**5.PS2.2:** Make observations and measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

**5.PS2.5:** Explain how forces can create patterns within a system (moving in one direction, shifting back and forth, or moving in cycles), and describe conditions that affect how fast or slowly these patterns occur.

**5.ETS1.1:** Describe how failure provides valuable information toward finding a solution.

**5.ETS2.2:** Describe how human beings have made tools and machines (X-ray cameras, microscopes, satellites, computers) to observe and do things that they could not otherwise sense or do at all, or as quickly or efficiently.

**5.ETS2.3:** Identify how scientific discoveries lead to new and improved technologies.

### **SIXTH GRADE**

**6.PS3.1:** Analyze the properties and compare sources of kinetic, elastic potential, gravitational potential, electric potential, chemical, and thermal energy.

**6.PS3.2:** Construct a scientific explanation of the transformations between potential and kinetic energy.

**6.PS3.4:** Conduct an investigation to demonstrate the way that heat (thermal energy) moves among objects through radiation, conduction, or convection.

**6.ETS1.2:** Design and test different solutions that impact energy transfer.

### **SEVENTH GRADE**

**7.PS1.3:** Classify matter as pure substances or mixtures based on composition.

**7.PS1.5:** Use the periodic table as a model to analyze and interpret evidence relating to physical and chemical properties to identify a sample of matter.

**7.PS1.6:** Create and interpret models of substances whose atoms represent the states of matter with respect to temperature and pressure.

### **EIGHT GRADE**

**8.PS2.1:** Design and conduct investigations depicting the relationship between magnetism and electricity in electromagnets, generators, and electrical motors, emphasizing the factors that increase or diminish the electric current and the magnetic field strength.

**8.PS2.2:** Conduct an investigation to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.

**8.PS2.3:** Create a demonstration of an object in motion and describe the position, force, and direction of the object.

**8.PS2.4:** Plan and conduct an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

**8.PS2.5:** Evaluate and interpret that for every force exerted on an object there is an equal force exerted in the opposite direction.

**8.PS4.1:** Develop and use models to represent the basic properties of waves including frequency, amplitude, wavelength, and speed.

**8.PS4.2:** Compare and contrast mechanical waves and electromagnetic waves based on refraction, reflection, transmission, absorption, and their behavior through a vacuum and/or various media.

**8.PS4.3:** Evaluate the role that waves play in different communication systems.