

Science Fair Project Ideas and Resources

The greatest hurdle facing most students when starting a science fair research project is the selection of a topic. Though many books have been written describing projects, few of the projects described, especially in the older books, are true research projects.

This handout is designed as a quick resource when a student asks the familiar question 'What kind of project can I do?' Each project title can be designed with one experimental variable. All other factors affecting the outcome of the student's research can be controlled. The methods book, *Nuts and Bolts of Science Fair Projects*, is perhaps the best, simple guide to basic student scientific research.

Paper

- How does wetting paper affect its strength?
- How can you fold paper to make it support more weight?
- Which paper has the fastest capillary action?
- Which paper plate will carry the most weight without buckling?
- Does the color of a paper towel affect the amount of water it will absorb?
- Does the color of a paper towel affect its strength?
- Do different types of paper change color when exposed to sunlight?
- Do different types of paper change color when exposed to heat?
- Do different types of paper change in strength with changes in humidity?
- Does the thickness of paper affect its strength?

Evaporation

- How does temperature affect the rate of evaporation?
- Do additives affect the rate at which water evaporates?
- Does the size of its container affect the rate at which water evaporates?
- Does air movement affect the rate at which water evaporates?
- Does the viscosity (thickness) of a liquid affect its evaporation rate?

Absorption

- Does the size of a sponge affect the amount of water absorbed?
- Do the size of the holes in a sponge change the amount of water it can absorb?
- Does the material from which a sponge is made affect the amount of water absorbed?
- Is the amount absorbed by a sponge affected by the type of fluid being absorbed?

Fabrics

- Does the drying rate vary with different fabrics?
- Which kinds of fabrics are easiest to dye?
- Which fabrics are the best insulators?
- Which fabrics absorb the most moisture?
- Which fabrics absorb moisture fastest?

Soft Drinks

- Which drinks are the most carbonated (have the most fizz)?
- Do drinks stay colder longer in cans or bottles?
- Can people distinguish between brands of soft drinks?
- What effect do different soft drinks have on various materials (for examples, meat, vegetables, pastry, paper, fabrics)?

Ice

- What factors affect the rate at which ice melts (size, shape, additives)?
- Do additives affect the time required for water to freeze?
- What materials are the best insulators for ice?

Sugar

- Does water temperature affect the rate at which sugar dissolves?
- Does water temperature affect the amount of sugar that can be dissolved in a given volume?
- Does the shape of a piece of candy affect the rate at which it melts?
- Does the size of a piece of candy affect the rate at which it melts?
- Do different kinds of candy melt at different rates?

Music

- Does music affect the respiration rate of fish?
- Does music affect the activity of fish?
- How does the pitch of a bottle change when the volume of water in the bottle is changed?
- How do different kinds of string material affect the pitch of a guitar?
- Does the length of a pitch pipe affect its pitch?
- Does the speed of a passing vehicle affect the change in pitch demonstrated by the Doppler effect?

Soap

- What kind or brand of soap makes the most bubbles?
- What kind or brand of soap bubbles last the longest?
- What kind or brand of soap or detergent cuts greases best?
- How do soap bubbles react to additives in the water?
- How does glycerin affect the size and/or strength of blown soap bubbles?

- Can soap bubbles be made in a variety of shapes?

Bouncing Balls

- How does the drop-height of a ball affect the height of its bounce?
- How does the drop-height of a ball affect the number of times it will bounce?
- How is the bounce of a ball affected by the surface on which it bounces?
- How does the material from which it is made affect the bounce of a ball?
- How does the distance from a light change the size of an object's shadow?
- How is a shadow affected by the brightness of the light source?
- How is the size of a shadow affected by the size of the object casting the shadow?

Light

- Does the area covered by a light beam change with the distance to a surface?
- Does the strength of a light beam change with the distance to a surface?
- Does the area covered by a light beam change with the angle between the beam and a surface?
- Does the amount of light on a given area of a surface change with the angle between the light beam and the surface?

Acceleration

- Does the speed of a cart rolling down a ramp change with the angle of the ramp?
- Does the speed of a cart rolling down a ramp change with the mass of the cart?
- Does the speed of a cart rolling down a ramp change with the size of the wheels?
- Does the speed of a cart rolling down a ramp change with the placement of mass in the cart?
- How does the speed of a car rolling down a ramp, compare to the distance it can roll on a flat surface?
- Does the speed of a ball rolling down a ramp change with the kind of material from which the ball is made?
- Does the speed of a ball rolling down a ramp change with the kind of surface on which the ball is rolling?

Solution

- Does Alka-Seltzer dissolve at different rates in different substances?
- Does temperature affect the rate at which Alka-Seltzer dissolves?
- Do different brands of antacid dissolve at different rates?
- Do different brands of antacid neutralize different amounts of acid?
- Which antacid neutralizes acid fastest?

Fruits

- Does temperature affect the rate at which a banana ripens?
- Does the size of a fruit affect the number of seeds it contains?
- Does the size of a fruit affect the amount of juice it contains?
- Does the kind of fruit affect the amount of juice it contains?

Rubber Bands

- Are thicker rubber bands stronger?
- Does the strength of a rubber band vary with temperature?
- Does using a rubber band affect its strength?
- Does exposing a rubber band to sunlight change its strength?
- Does exposing a rubber band to chemicals change its strength?
- Does exposing a rubber band to heat change its strength?
- Does exposing a rubber band to radiation change its strength?

Popcorn

- Does the method of popping affect the volume of popcorn?
- Does the method of popping affect the ratio of popped to unpopped kernels?
- Does the brand of popcorn affect the ratio of popped to unpopped kernels?
- Does the amount of moisture affect the ratio of popped to unpopped kernels?
- Does the storage temperature of popcorn affect the ratio of popped to unpopped kernels?
- Does the type of oil used affect the ratio of popped to unpopped kernels?
- Does the temperature of popping affect the ratio of popped to unpopped kernels?
- Does popping time affect the ratio of popped to unpopped kernels?

Bag Strength

- Is the cost of a plastic garbage bag related to its strength?
- Is the strength of a plastic garbage bag affected by its thickness?
- Is the strength of a plastic garbage bag affected by exposure to sunlight?
- Is the strength of a plastic garbage bag affected by exposure to radiation?
- Is the strength of a plastic garbage bag affected by freezing?
- Which brand of plastic garbage bag is strongest?
- Does moisture affect the strength of paper grocery bag?

The Outer Banks

- Do different plants grow in different areas of a barrier island?
- What factors affect the type of plants that can grow in different areas of a barrier island?
- How do the size and shape of sand grains vary across a barrier island?
- Does the salt content of shallow wells vary across a barrier island?
- Does the character of sand grains vary from one barrier island to another?

Pollution

- What kinds of particles are found in our air?
- How does particulate air pollution vary from one area to another?
- Does particulate air pollution vary depending on the way people use an area?
- Does the amount of precipitation affect the amount of particulate air pollution?

Precipitation

- Does precipitation vary from place to place within a storm?
- Does precipitation contain solid particles?
- Does the acidity of precipitation vary with the amount that falls?
- Does the acidity of precipitation vary with the seasons?
- What is the average speed of the wind in (city)?
- Does the speed of the wind vary with the direction from which it blows?
- What direction does the wind blow from in (city)?
- Is the direction from which the wind blows related to weather systems?

Temperature

- Does temperature vary with height above the ground?
- Does the kind of vegetation in an area affect the temperature near the ground?
- Is the temperature variation different on different sides of a building?
- Does the kind of surface (concrete, asphalt, grass, dirt & water, etc) affect the way temperature varies near ground level?
- Does the drying time of paint vary with temperature?

Environment

- What impact does automobile traffic have on animal life and death in (city or county)?

Magnets

- Does adding coils of wire to an electromagnet increase its strength?
- Does the material from which an electromagnet core is made affect its strength?
- Does the voltage applied to an electromagnet affect its strength?
- Does changing the current flowing through an electromagnet change its strength?
- How does the force between a piece of metal and a magnet vary with distance?

Seeds

- Does the position in which a seed is planted affect the way its seedling sprouts?
- Does the sprouting time for a seed change with planting depth?
- Does the sprouting time for a seed vary with its size?
- Does sprouting time vary with soil temperature?
- Can a plant's response to gravity be changed?

Heat and Light

- Does the color of a surface affect the rate at which it absorbs or releases heat?
- Does the texture of a colored surface affect the rate at which it absorbs or releases heat?
- Does the color of light affect the rate at which it is absorbed by a surface?
- Can infrared energy be detected in a spectrum?
- Does boiling an egg change its mass?

Facial Tissue

- How does the resistance of Kleenex to blowing (compressed air) vary from brand to brand?
- How does the resistance of Kleenex to blowing (waft) vary from brand to brand?
- How does moisture affect the strength of Kleenex?

Oil/Friction

- How does the viscosity of oil vary with temperature?
- How does the slipperiness of oil vary with temperature?
- Do different oil weights behave differently (viscosity, slipperiness) with changes in temperature?

Fabrics

- Does exposure to sunlight cause nylon to deteriorate?
- Do changes in temperature and/or humidity affect the strength of nylon?
- Does exposure to sunlight cause rayon to deteriorate?
- Do changes in temperature and/or humidity affect the strength of rayon?
- Do woven mixtures of nylon, rayon, etc withstand sunlight and weather better than pure nylon or rayon?

Humidity

- Can human hair be used to indicate changes in humidity?
- Do different colors of human hair react differently to changes in humidity?
- Do straight and curly hair react differently to changes in humidity?
- Does treating hair with chemicals change its reaction to changes in humidity?
- Does the drying time of paint vary with humidity?

Mechanics

- Does the spacing of dominoes affect the rate at which they fall?

Human Physiology

- Does human weight change with time of day?
- How does exercise affect blood pressure?
- How does exercise affect body temperature?
- How does exercise affect respiration?
- Do males and females grow at different rates?

Epidemiology

- Can the life span of individuals buried in cemeteries be related to medical discoveries?
- Do the life spans of individuals buried in cemeteries reflect epidemics?
- Do the death rates of individuals buried in cemeteries reflect epidemics?

Physical Geology

- How is the distance a rock rolls in a stream related to rounding of its edges?
- How does the surface area of a rock change as it is broken?
- Does the composition of a rock affect its resistance to abrasion?