

Te Paepae o Aotea Science Badge

HOME PHYSICS			
<i>Complete 20 stars</i>			
Rating	No	Exercises in Home Physics	Sign
()	1	Use a bicycle with gears to find the amount of forward movement produced by one turn of the pedals in each gear. Plot a graph for an extra *	
*	2	Support a table tennis ball on an air jet produced by a vacuum cleaner. Why does the ball stay in the air jet? Now tilt the air jet and find out at what angle the ball will fall out	
**	3	Design and carry out an experiment to find the bounciest part of a tennis racquet (the sweet spot). Report your findings and your method	
**	4	Make a “telephone” using two cans or yoghurt pots or similar and a length of string between them. Report on how the length of the string affects the quality of reception. Can you make it work around corners? How? Demonstrate to your teacher	
**	5	Make an ice lens. Fill a small bowl with hot water and then tip the water out. Immediately cover the top of the bowl with glad-wrap and allow the bowl to cool. As the bowl cools, the glad-wrap will be pulled down. Place the bowl in a freezer and fill the space on top of the glad-wrap with water. After the water has frozen, you will have an ice lens. Write a brief report on what you see when you look at writing on a page through your ice lens	
*	6	Make a collage of physics related things from newspaper and magazine cuttings	
*	7	Make a paper glider from a piece of A4 paper. Time its flight when thrown from two metres above the floor (the height of a door). Alter the design to make it stay in the air longer. Record all your changes and results	
*	8	Make a poster about the Decibel Scale for sound. Include the effects of loud sounds on hearing and the safety precautions that should	

		be taken	
*	9	Make a force measurer by using a rubber band or a spring from a biro fixed to one end of a ruler. The other end of the rubber band / spring should have a paper clip to be used as a hook	
*	10	Use your force measurer from 8 to find out which sports shoes have the best grip. Try at least 5 different makes – borrow off your friends. Graph your results for an extra *	
**	11	Test to see if a saucepan of water boils quicker with the lid on or off. How does the size of the base effect the time of boiling? Remember it must be a fair test. Include a list of the things that you must keep the same when you are carrying out your experiments	
*	12	Find out about the calendar we use which was devised by Pope Gregory in 1582. Present your findings in an interesting way	
*	13	Put a balloon over the neck of a plastic bottle. Place it in the sun and observe what happens. Paint the bottle black or a dark colour and try the experiment again. Suggest reason(s) for any differences you observe	

*	14	Temperatures can be measured in Fahrenheit (F), Celsius (C) or in the scientific scale, Kelvin (K). Find out what you can about these scales	
**	15	Completely fill a small bottle screw top glass bottle with water. Screw the top down tightly, wrap in a plastic bag and put in the freezer. Check it some hours later when the water has frozen. What conclusions can you reach?	
**	16	Find out why the same side of the moon always faces the earth. Make a model to demonstrate this	
**	17	Build a car or boat which is powered only by a balloon. Modify your design so that it will go further than your first attempts	

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**	18	Find out about water clocks and then design and build a water clock, which can measure 2 minutes accurately	
**	19	Find out how a siphon works. Make a siphon using a short length of hose and two containers. Fill one container and the hose with water. Place the short part of the hose in the water and have the other end of the hose in the empty container. Investigate how the flow of water is controlled by the height difference of the two containers and the diameter of the hose	
***	20	Find out why sunsets and sunrises are red. Write a brief report. To demonstrate the effect, fill a large clear plastic container (eg. A 3 litre juice container) with water. In a darkened room, turn on a torch and hold it to one side of the container and look at the light through the container from the other side. Add drops of milk and stir until you can only just see the glowing bulb in the torch. What colour does the light appear to be now? Demonstrate this to your parents or teacher	
**	21	Francs Bacon in the time of Queen Elizabeth I said that hot water freezes more quickly than cold water. Check it out and write a brief report	
***	22	Make a torch with an on/off switch using a cardboard tube, some aluminium foil, batteries, and a bulb. Sellotape and wire	
***	23	Find out what a Cartesian diver is. Make your own using a 10 cm long thick shake straw which is sealed at the top with blu-tack and has enough small nails sellotaped to the bottom so that it only just floats in water. Place it in a large plastic code bottle completely filled with water and screw on the top. Find out what happens when you squeeze the bottle. Show	

		your teacher your diver in action	
*	24	Make a poster about the life and scientific works of a famous physicist such as Newton or Rutherford	
**	25	Fill a small jar one third with oil, one third with maple syrup and one third with liquid floor wax. Put the lid on the jar and shake well to mix the contents. Observe what happens after it has settled. Which is the least dense liquid and how do you know?	
**	26	Make a thermometer by half filling a film canister with coloured water. Drill a small hole in the lid to take an empty biro tube or straw. Push the tube through the hole to the bottom of the canister and seal around it with blu tack or chewing gum. Hold the canister in your hands and see how far the liquid rises in the tube. Mark the position. Try placing your thermometer in cold water and hot water	