

Objectives		Extra Information
<p>L.O:</p> <p>To Construct Functional Gears And Understand Their Operation.</p>	<p>MAIN TEACHING – Gearing Up with Candy Cogs (10 minutes) Ask your pupils if they know what gears are. Acknowledge any that mention wheels and describe gears as wheels with teeth or cogs. Taking time to explain what teeth/cogs are in this context, draw an example for the class. Ask the class to think of examples of gears they may have seen before this lesson. If they are having trouble, lead them towards bikes or even old clocks and expensive watches. Tell the class that today we will be making our very own gears.</p> <p>MAIN TASK – (30 minutes) Activity Breakdown (Use illustrated instructions provided if there is any confusion - if you do not have access to the right materials you can use cardboard and a gluestick/tape): Lay a lid flat on the table.</p> <ol style="list-style-type: none"> ➊ Place candy around circumference of lid touching each other. ➋ Make sure there is an even number of candies around the lid, if not, remove one and space the others out evenly. ➌ Remove every other candy, leaving an even gap between each remaining candy. ➍ Using a marker pen, mark the location of each candy on the lid. ➎ Glue each candy to the lid where the mark has been made. ➏ Repeat steps 1-6 with a different sized lid. ➐ Pin finished gear to board with candy cogs interlocking. <p>Mini-Plenary: With the two gears interlocked, ask your class if you spin one clockwise what will happen to the other? Try to get a class consensus before asking the class to try for themselves. Explain that any two connecting gears will rotate in opposite directions.</p> <p>Now ask your class whether the larger or smaller gear spins faster, give them the choices of smaller, bigger, or both being the same, and let them try.</p>	<p>Materials Required:</p> <ul style="list-style-type: none"> ▶ Plastic lids with lips and with holes pre-drilled through centre (various sizes) ▶ Candy (gumdrops or similar) ▶ Glue Gun ▶ Pins ▶ Board (for pins) ▶ Marker pens ▶ Whiteboard/IWB <p>Key Words:</p> <ul style="list-style-type: none"> ▶ Gear ▶ Teeth/Cogs ▶ Interlocking ▶ Clockwise/Counter-Clockwise <p>Success Criteria:</p> <ul style="list-style-type: none"> ▶ I can construct and understand a two-gear system. ▶ I can construct and understand a multi-gear system. ▶ I can construct and understand multi-gear systems and how gears of different sizes interact.

Objectives

Ask the class again, there may still be some disagreement, either way ask them to draw a straight line on both lids so that the tips are touching.
Ask them to spin again and ask which line went all the way around first. Explain that the smaller of two connecting gears always spins faster. It may help them to think of it as the bigger gear taking longer to turn around.

Discuss with the class how gears can be used in everyday life. Again lead them towards the gears on bikes allowing you to go faster whilst pedalling at the same speed, but that to do so requires more energy.

If the class is quick with this activity allow them to make more gears and experiment with multiple gears in a system.

PLENARY – (20 minutes)

Draw three circles on the whiteboard laid out like a triangle, draw arrows in two circles demonstrating the rotational direction of these circular ‘gears’. Ask the class what direction the third ‘gear’ will turn. Explain that this system will not work because that gear can’t turn both ways.

Draw four circles on the board in box formation, this time draw a directional arrow in only one. Ask pupils to come to the board and add arrows to complete the system, then ask the class if this system will work.

Repeat a few times for more and more circles. Tell the class that these are all circular systems and ask if they notice a pattern. Lead them towards whether the number of ‘gears’ being odd or even matters, and eventually to the idea that in a circular system there must be an even number of gears.

If time allows, invite pupils to draw their own system of circle gears on the board and work through them as a class.

Extra Information

Main Task:

