



Click-Clock

Design and technology

- Combining materials and components
- Using mechanisms – gears
- Testing before making improvements

Science

- Measuring time
- Calibrating scales
- Investigating momentum
- Energy
- Scientific investigation

Vocabulary

- Pendulum
- Accuracy
- Calibrate
- Scale
- Energy

Other materials required

- Stopwatch or timer

Connect

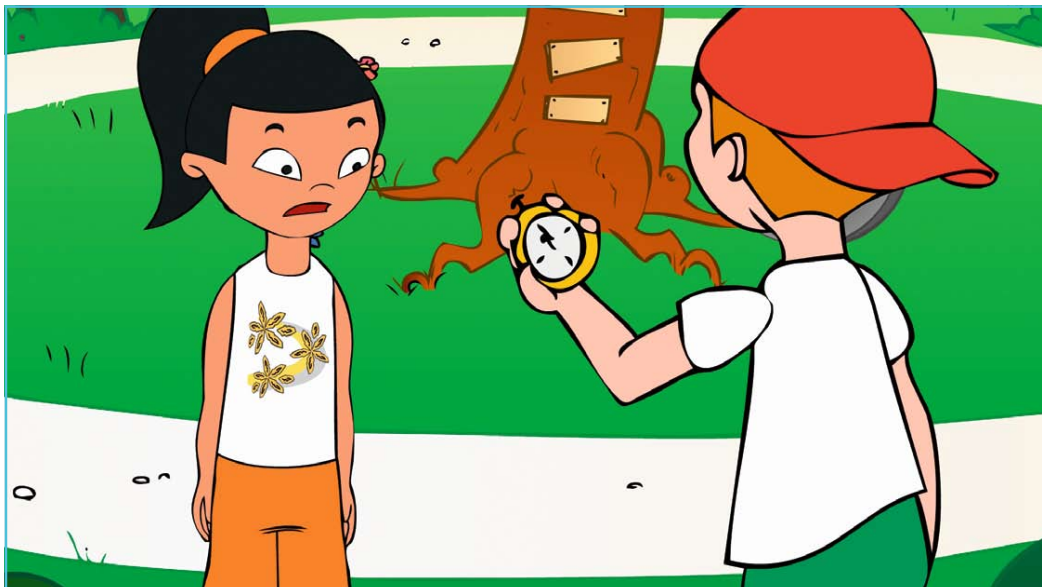
Jack and Jill have been watching the Olympics on the TV and have become quite keen on finding out what it takes to beat Olympic records. They go out in the garden and decide to race 3 times around the old oak tree on the lawn.

Jill is the first to go and Jack says: "Ready, Set, Go!" He presses the stopwatch in his hand at the exact time of saying "Go"! Unfortunately, in his excitement, Jack presses too hard and the stopwatch breaks.

How are they now going to time the race around the oak tree?

How can we make a timer that can help us time races?

Let's find out!



Construct

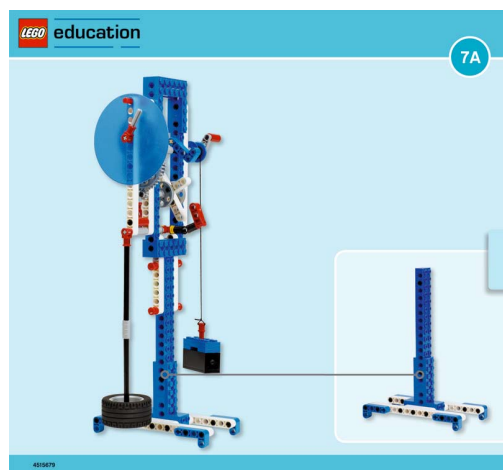
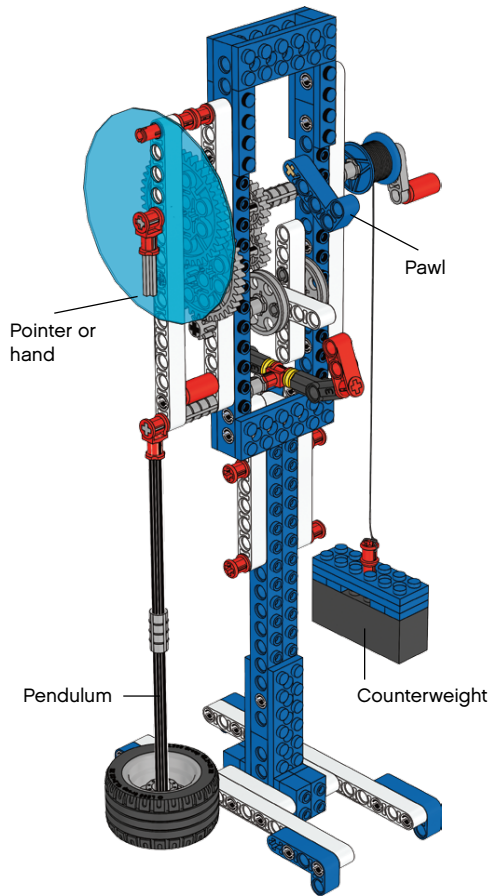
Build the Click-Clock

(all of book 7A and book 7B to page 17, step 26).

Release the pawl stopping the top axle, extend the gear wheels and use the handle to wind up the counterweight. Reposition the gear wheels, reset the pawl and start the pendulum swinging.

What happens?

The Click-Clock starts to tick.



Contemplate

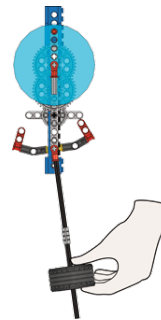
Making time go slower or faster!

First predict, then test.

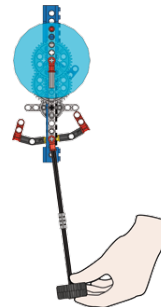
A. Make sure the big wheel is at its lowest position. How many seconds does it take for the pointer to go around the dial once?



B. Slide the big wheel high up on the axle, set the pendulum swinging, and try timing it again.

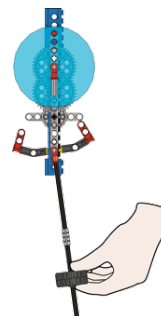


C. Change the pendulum to a small wheel as shown on page 18, step 27. How many seconds does it now take for the pointer to go around the dial once?



Calibrating to 1 minute

It is possible to calibrate to almost 1 minute. Move the small wheel up and down the pendulum until you find a position where the pointer goes around the dial in approximately 60 seconds.



Tip:
You can get close to 1 minute by positioning the wheel approximately 3 cm up the pendulum.

Continue

Long Pendulum

(book 7B to page 20, step 3).

How about finding out what happens when the pendulum is made much longer?

Place the Click-Clock at the edge of a table.
Hold the base to keep it steady.
What happens?

