**ACTIVITY: Heartbeat calculator**

**Activity idea**

In this activity, students calculate the number of times their hearts have beaten since they were born.

By the end of this activity, students should be able to:

* explain that their heart (cardiac muscle) is an involuntary muscle
* locate their pulse and determine pulse rate
* investigate and find meaning for very large numbers

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**Introduction/background**

Cardiac muscle is an involuntary muscle. (You don’t need to tell your heart to beat!) It is a specialised kind of muscle found only within the heart, which pumps blood through the body. The average person’s heart beats more than 4000 times in an hour (figuring on an average of 70 beats per minute), so by the time someone turns 70, their heart will have beaten about 2.5 billion times (2, 500, 000, 000). Cardiac muscle, like smooth muscle, does not tire.

Students enter their date of birth into this calculator to get an estimate of how many times their hearts have beaten since they were born.

**What you need**

* Access to the article [Muscle types](http://link.sciencelearn.org.nz/resources/1919-muscle-types)
* Stopwatch or similar
* Access to the [heart beat calculator](http://link.sciencelearn.org.nz/resources/1927-heartbeat-calculator) (Excel spreadsheet)

**What to do**

1. Review the article [Muscle types](http://link.sciencelearn.org.nz/resources/1919-muscle-types) for either your own or students’ understanding.
2. Ask students to work out their heart rate by placing two fingers across the artery on the underside of their wrist or on the side of their neck. (Watch the short YouTube video on how to do this at [www.youtube.com/watch?v=QElJxkwNfPc](http://www.youtube.com/watch?v=QElJxkwNfPc).) Students count the number of beats over 30 seconds and multiply by two. (Older students can repeat this three times to find the average number of beats per minute.)
3. Students enter their date of birth, today’s date and heart rate into the Excel heart beat calculator.
4. Ask students to write down the number of beats their heart has produced since birth. Have them annotate the number to separate it into hundreds, thousands and millions. See if younger students can read the number out loud.

**Extension ideas**

* Students use their own data and that from four friends to produce a graph of the results.
* Use data from the whole class to produce a stem and leaf graph.
* Investigate how heart rate changes throughout a person’s life.
* Investigate the heart rates of other animals and compare them with human heart rates.