

Outdoor Learning, Numeracy

Learning experience	
Make a sundial for the spring equinox	
CfE Level - Second	
Experiences and Outcomes and associated benchmarks/skills	
<p>E&Os</p> <p>MNU 2-10b I can carry out practical tasks and investigations involving timed events and can explain which unit of time would be most appropriate to use.</p> <p>MTH 2-12a I have worked with others to explore, and present our findings on, how mathematics impacts on the world and the important part it has played in advances and inventions.</p> <p>MTH2-17b I can accurately measure and draw angles using appropriate equipment, applying my skills to problems in context.</p> <p>MTH2-17c through practical activities which include the use of technology, I have developed my understanding of the link between compass points and angles and can describe, follow and record directions, routes and journeys using appropriate vocabulary.</p>	<p>BMs/Skills</p> <p>Chooses the most appropriate timing device in practical situations and records using relevant units.</p> <p>Selects the most appropriate unit of time for a given task and justifies choice.</p> <p>Contributes to discussions and activities on the role of mathematics in the creation of important inventions, now and in the past.</p> <p>Measures and draws a range of angles to within + or – 2 degrees.</p> <p>Uses knowledge and the link between 8 compass points and angles to describe, follow and record directions.</p>
Overview of learning experience	
Pupils make a sundial and record the shadow location every hour to demonstrate how a sundial works for telling the time.	
Outline of learning	
<p>LI/SC</p> <p>I can position a sundial fin facing south.</p> <p>I can mark the angle of the shadow every hour for 4 hours.</p> <p>I can measure the angle of movement for each hour.</p> <p>I can discuss the use of this technology and its developments to the present day.</p>	<p>Resources</p> <p>Sundial fin template.</p> <p>Chalk to write on playground or laminated sheet and board pens to put under the fin for marking angles.</p> <p>Protractor for measuring angles.</p> <p>Camera to photograph work.</p> <p>Other timing devices, egg timer, watch, digital clock, water clock, candle clock.</p>
Description of learning experience and assessment opportunities	
Met Office template and instructions for this here .	

Pupils should cut out the sundial fins in the template and place them in a sunny area (somewhere which will not end up in the shade of building or trees during the day). Pupils should mark or measure the angle of the shadow created by the fin at the beginning and every hour for 4 hours. This will show the progress of the sun across the sky throughout the day and demonstrate how you could tell the time using a sundial. You could discuss that in March is the spring equinox so our clocks change. Also our day and night are equal in length. This would be a way of telling what date in the year it was before calendars were used. Time between measurements could be used to build other time measuring devices such as a water clock or candle clock or work could be done on tablets to research the development of timing technology.

Consideration of risk

Pupils should not look directly at the sun.

If making a candle clock consider that this will involve an open flame.

Taking it further – what else could you do?

Ask pupils to design their own timing device, see taskmaster challenge https://www.comedy.co.uk/tv/taskmaster/videos/18633/the_most_inventive_egg_timer/

Pupils could research developments in time technology and present to the class on their findings.

Could give each pupil a timing technology to research and present on.