

<p>Date</p>	<p>Class Level Fifth and Sixth Class</p>	<p>Subject Geography</p>
<p>Strand Natural Environments</p>	<p>Strand Unit Planet Earth and the Sun (and the moon)</p>	
<p>Title Learning about gravity and tides and understanding how tides affect me</p>		
<p>Objective(s) The children will learn about how the earth, moon and sun interact through gravity. The students will develop an understanding of what causes tides. The students will also investigate the importance of tidal prediction and learn to read tide tables.</p>		
<p>Skills Required The child will be enabled to use their questioning, observing, predicting and investigation, analysing as well as their recording and communication skills to develop an understanding of how gravity affects the earth, moon and sun – resulting in our daily tides.</p>		
<p>Learning Objectives</p> <p>It is recommended that this lesson is conducted over at least 2 days in parts.</p> <ul style="list-style-type: none"> • Orbits of the Earth, Moon and Sun • The Moon’s Cycle and Phases • Gravity and the Earth, Moon and Sun • Gravity and tides • Spring and Neap tides • The importance of predicting the tide • Reading a tide table • Other things that affect tides • A questionnaire / quiz “My understanding of tides and reading tide tables” is also available to measure the children’s understanding of the lesson provided and highlight where further explanation may be required. 	<p>Learning Activities</p> <p>KWL chart: Begin the lesson using a KWL chart, where students can track information before and after the lesson. Ask students leading questions from the chart:</p> <ul style="list-style-type: none"> • What do you already ‘know’ about this topic? • What things do you ‘want’ to learn about the topic • What did you ‘learn’ from doing your research? <p>Teacher Directed Approach:</p> <p>Begin the lesson with an anecdote about when we go to the beach and build a sand castle / or fall asleep soaking up the sun, the water level can change.</p> <p>Create a mind map and ask the students to consider what they think causes tides?</p> <p>To get a better understanding of tides, provide another anecdote about how we need to understand the moon, earth, sun and the effects of gravity.</p> <p>Activities: Using the Explorers teachers resource Power point presentation “Explaining</p>	

tides to Children” discuss and complete the activities with the children.

Part 1:

- Orbits of the Earth, Moon and Sun

Get the children to draw a picture to demonstrate the rotation and orbits of the Earth, Moon and Sun.

- The Moon’s Cycle and Phases

Present a list of the names of the phases of the Moon and pictures of the phases. Have the students work in small groups to match the names of the phase and draw a picture of what the Moon would look like.

- Gravity and the Earth, Moon and Sun

Discuss gravity – this may be complimented demonstrations outside:

- dropping a ball to the ground
- swinging a bucket of water around
- swinging an weighted object tied to a string etc

Part 2:

- Gravity and tides

Get the students to draw a picture to illustrate their understanding of how gravity and tidal forces (ocean bulges:– high tides and stretches: low tides) work. Note a lot of images on the internet can be misleading and cause more confusion. If using additional images (along with the presentation) try and find images that are consistent with the positioning of the top of the earth / side of the earth etc.

- Spring and Neap tides

Discuss gravity and tides using the images in the Power point to explain tidal forces and the ocean bulge etc.

Part 3:

- The importance of predicting the tide

Split the class into teams and ask the students to assess why it is important to understand tides – especially when reading tide tables.

Look at coastal towns in Ireland that are affected by rising tides and consequential flooding.

- Reading a tide table

Provide copies of a tide table to the groups of children. Try and source a tide table of that is from your area and is relevant re: date of when you may consider going to the seashore.

Discuss how a read a tide table with the class indicating the different features e.g. tide date, times, tide height – indication high and low tides, full moon, new moon, half moon etc.

Get the students to complete the exercise answering key questions, learning how to interpret tide tables.

Get the teams to create graphs showing the changing high tide during a week or over a month using key dates.

- Other things that affect tides:

Discuss other features that can affect tides nationally and internationally.

Get the students to look up the internet and find places in other parts of the world that are not affected by tides. Get them to explain why.

- Complete the question / quizzes to assess the children's understanding of gravity and the tides as well as their understanding tides and reading tide tables

	<p>Resources</p> <ul style="list-style-type: none"> • KWL chart • Explorers teachers resource Power point presentation “Explaining tides to Children” • Local tide table (tide tables can be purchased at local angling shops, published in local newspapers or can be downloaded from the internet .e.g.www.sailing.ie Questions relating to reading tide tables – at the end of this lesson plan: <ul style="list-style-type: none"> - Question Sheet 1: My understanding of gravity and the tides - Question Sheet 2: My understanding of tides and reading tide tables” • Internet access
<p>Differentiation Higher and Lower order questioning. Differentiate group activities and roles to account of individual needs, by support, task. Mixed ability pairing.</p>	
<p>Assessment Students: KWL chart (What I know, What I want to know, What I learned) Teacher observation and questioning: Mind Mapping Examine learning outcomes before and after e.g. knowledge, understanding, skills. Evaluation: Reflect on learning experiences that lead to the outcomes e.g. attitudes, enjoyment, as well as motivation to learn about the subject.</p>	
<p>Linkage and Integration Science – Energy and Forces – Forces Maths – Measures / Data – Time / Recognising and interpreting data Geography - A sense of place and space / Maps, globes and graphical skills strands can also be used to expand projects on tides.</p>	

Question Sheet 1: My understanding of gravity and the tides

1. Select the correct answer to the question below:

How long does it take for the Moon to orbit Earth?

- a. approximately 28 days – nearly a month
- b. 30 days
- c. 25 days

2. Is the following statement true or false:

The time it takes for the Earth to rotate once around its own axis is about 23 hours and 56 minutes.

- a. True
- b. False

3. Can you place the phases of the moon's cycle in order: Last Quarter, Full moon, New moon, First Quarter

4. Is the following statement true or false?

The force of the sun's gravity on the earth is stronger than the moon.

- a. True
- b. False

5. Complete the following paragraph by filling in the missing words: gravity, ocean, Earth, two, tides. twelve.

The force of gravity of the Moon creates what we call tidal forces. The _____ from the moon changes the shape of the _____ causing it to bulge at the point closest to the Moon and at the point farthest from the Moon. As the solid ground of the _____ rotates (faster than the moon), each point on the Earth passes through the side closest to the Moon *and* the side farthest from the Moon once per day. This creates _____ high _____ as well as two low tides each day – every _____ hours.



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6. How many times do we have Spring tides in a month? _____

7. Explain why?

8. Is the following statement true or false?

The time of a high tide each day is different because the Moon takes slightly longer than 24 hours to line up again exactly with the same point on the Earth during its rotation - about 50 minutes more. Therefore, the timing of each high tide changes throughout the course of a month.

a. True

b. False

9. Why are storms more dangerous for coastal villages, towns and cities during a Spring tide?

10. What else may affect the height of tides around the world?

Question Sheet 2: My understanding of tide tables

Using the tide table provided, answer the following questions:

1. What date is there a full moon? _____

2. What date is there a new moon? _____

3. What date is there a half moon? _____

4. During a full moon type of tides are these called?

5. What are the time and heights (high tide and low tide) during a half moon?

6. What type of tides are these called? _____

7. When comparing the tides during the full moon and the half moon, which has the lowest low tide and the highest high tide? _____

8. If you wanted to go to the beach in weekend to go fishing (e.g. when the tide was high), what day and time would you go?

9. If you were to go to the beach during school time with your class to explore the seashore, what day and time would you recommend that you and your class go?

10. List three groups of people who are interested in the tides. Think about the people who work at sea or use the ocean for recreation: _____
