**The Universe – Tides Notes & Worksheet 1**

  Tides are the regular rising and falling of the sea. You have seen this if you have been to the ocean. When it is HIGH tide, the water has come a long way up the beach and at LOW tide you will see lots of the shore because the sea has gone a long way out. There are about TWO high tides and TWO low tides a day.

  Tides are due to the **gravity** of the **Moon** trying to pull the part of the sea closest to it towards it. In the (exaggerated) diagram below, there will be a **high** tide at point A, called the **near** tide, because of this pulling effect. There will also be a high tide on the opposite side of the Earth at point C, called the **opposite** tide. At points B and D there will be a **low** tide.

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| tides1 |

  The Earth rotates once every 24 hours which means that the places on the Earth where HIGH and LOW occur tides are always changing. The diagram below shows where HIGH and LOW tides will be 6 hours after the diagram above.

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| tides2 |

  The **Sun** also has a gravitational effect on the sea. Although the Sun is larger than the Moon, it is **further** away from the Earth, which means that it has **less** effect on our tides. Twice a month, during the **new moon** and the **full moon**, the Moon and the Sun are in line with the Earth and so they pull together. This causes very high high tides and very low low tides called **SPRING** tides.

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| tides3 |

 Twice a month, during the **first** and **third (or last) quarters**, the Sun and Moon are at right 2 angles to each other, and so their pulls sort of cancel each other out, and are not as great. This causes much smaller tides. These are called **NEAP** tides.

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| tides4 |

**QUESTIONS ON TIDES**

1. If it is LOW tide at a harbor at 9:00 am, at about what time would you expect it to be HIGH tide in the afternoon? \_\_\_\_\_\_\_\_\_\_\_\_
2. If it is HIGH tide at 8:00 pm, when would you expect the next HIGH tide to be? \_\_\_\_\_\_\_
3. The following two diagrams show the position of the Sun, Moon and Earth. Which would produce the HIGHEST tides? Give reasons for your answer. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| tides5 |