



CREATIVE SESSION 5

PRESSURE AND TIDES

ABOUT PRESSURE AND TIDES

With the aid of modern technology we can quickly access tidal predictions to the closest five minutes for any day, years in advance. While this information seems incredibly accurate, it is actually only based on astronomical factors (the relative positions of earth, the sun and moon) and does not take into account the weather, which can have a huge impact on the tide height. To get a more realistic picture of what to expect, you must work it out yourself...

The main weather variable affecting tide height is air pressure. This is the 'weight of air' at sea level and it is driven by temperature; hot air rising creates low pressure while cold air sinking creates high pressure. The reason this affects tides is because cold air sinking (sunny days) literally pushes down then sea to make lower tides, while warm air rising (cloudy days) does the opposite. This is why low pressure makes higher tides; for every 1mb drop in pressure, the tide rises by 1cm. In extreme cases, this can raise the sea level by 3 metres!

The average air pressure at sea level is 1013mb. Although there is no formal level for high pressure, 1030/1040mb would be considered high, while 960/970mb would be very low. To find the air pressure, you can check a weather forecasting app that will show the predicted pressure every hour of the day for the coming week. You can also look at a barometer measuring current pressure, or check a synoptic chart that links places with equal pressure with isobars. The advantage of synoptic charts is that they give a large-scale overview which helps make sense of what you are experiencing on a local level (see Module 4: Winds & Creative Session 4: Wind Circulation).

The purpose of this Creative Session is to show the relationship between weather, wind and pressure so that you will be better able to judge how air pressure affects tides.

INSTRUCTIONS

Step 1

Cut out the white from pages 4/5/6 so you have three pieces.

Step 2

Remember to cut the 'windows' of the Front and Middle on pages 4 and 5. It can be fiddly, but you'll see why they are important once the model is assembled. A stanley knife or scalpel is ideal for this task.

Step 3

Lay the three pieces in order. The 'Back' on page 6 goes on the bottom, the 'Middle Tab' on page 5 is in the middle and the 'Front' on page 4 goes on top.

Step 4

Celotape the edges of the front and back together so the tab in the middle can slide up and down. Now you have a model that shows how air pressure affects the tide! Slide the tab up and down to see what happens...

Tip When the weather is sunny, tides will be lower. This is because the high air pressure associated with higher pressure literally pushes down the sea to make lower tides.

PRESSURE = **TIDES**

TYPICAL WEATHER

* Winds are stronger when isobars on synoptic chart are closer together

VERTICAL MOVEMENT OF AIR

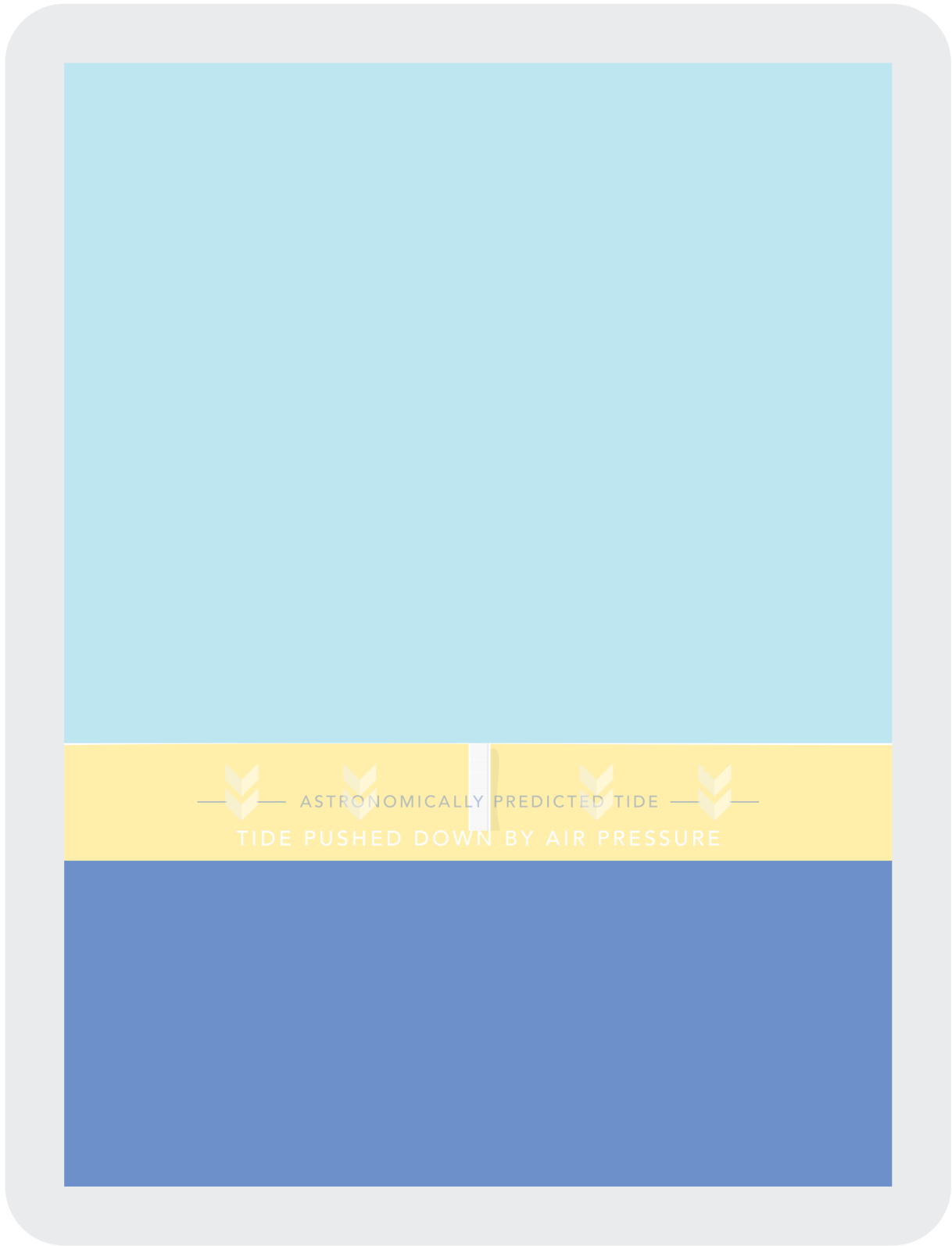
WIND DIRECTION ON A SYNOPTIC CHART

In the Northern Hemisphere, winds blow clockwise around a high pressure system and anti-clockwise around a low

Above: The Front



Above: Middle 'Tab'



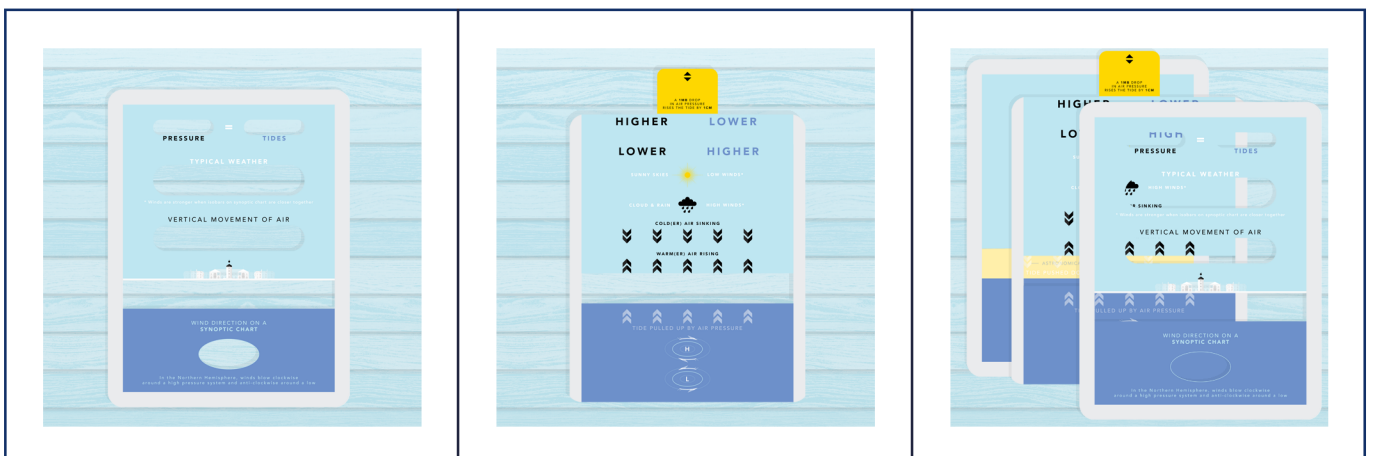
Above: The Back



STEP 2

STEP 2

STEP 3



Share photos of your model!
 Tag us on social media @tideschool