Activity 2.1 - suggested answers

Table 1: River or estuary results

Description of what happened

Data and calculations

Length of rope

Time to run length out

Speed of current

(Distance/time)

Direction of current

Questions

1. How fast was your current?

   Students own answers

2. In what direction did it go?

   Students own answers

3. What causes currents?

   Students own answers

4. Do you think currents will change during the day and if so what could cause these changes?

   Tides, low pressure systems

Map of study area

Show direction of current flow and main features

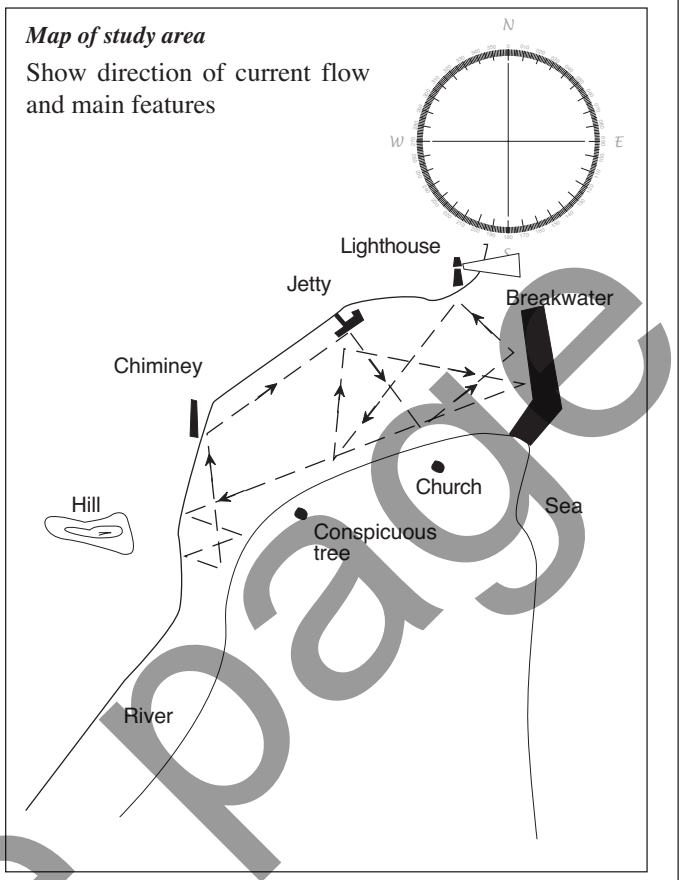


Table 2: Beach results

Questions

1. Which direction did the current flow?

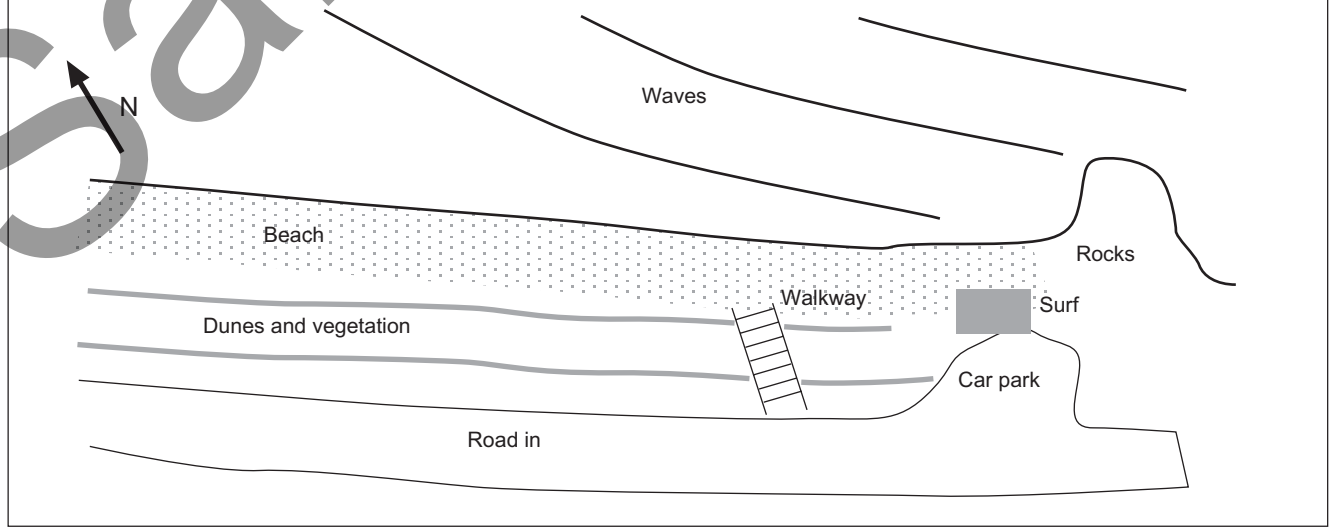
   Students own answers

2. Which orange travelled faster - inshore or far out?

   Students own answers the ones in closest should travel faster

Map of study area

Show north and main features of beach



Appendix 3 Laboratory work

3.1 Weather front demonstration

Aim

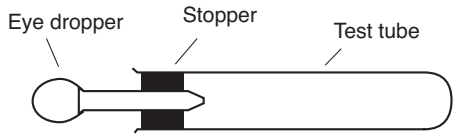
To observe what happens when two different temperature fronts collide.

Materials

- Food colour dye
- 2 eye droppers fitted with rubber corks
- bunsen, tripod, gauze mat, bench protector
- beaker
- 2 test tubes

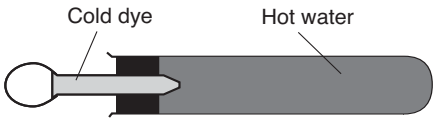
Method

Set up the test tubes as shown by the diagram below.



Part A. Cold front

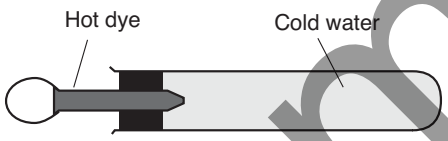
1. Fill test tube with hot water and set up as shown in the diagram below.



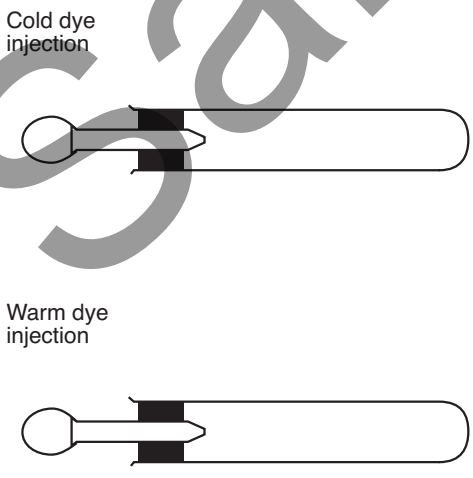
2. Add cold dye slowly and record what happens.

Part B. Warm front

1. Heat some dye in a beaker using the bunsen.
2. Fill test tube with cold water as shown in the diagram below.



3. Add hot dye slowly and record what happens.



Teacher feedback

I've done something similar years ago with red dye (hot water) and blue dye (warm) in a 4 foot fish tank with a divider in the middle. Fill both sides, remove divider, and away you go! Get a bit of mixing and swirling when the barrier is removed.

Similarly I have demo'd convection currents in the ocean by heating water (not boiling) in a large beaker over a bunsen, and adding a couple of KMn04 crystals. The colour rises. I then put an ice cube with loads of food colouring in it into another beaker. The colour falls. When both the diagrams are combined, it nicely complements the onshore/offshore wind diagrams.

Conclusion

The dye and water in the experiment represented two air masses.

Appendix 4 Classroom activities

4.1 The active beach system

Based on an original exercise by Gwen Connolly, St. Augustine's College

Method

1. Read the instructions to the three level guide in Figure 130.1.
2. Now read the article on the page opposite, then complete the following:

Level 1 Literal — reading for accuracy

a. For each of the following statements write T (true) or F (false) in the space just after the number.

b. Be able to show where these statements appear in the article.

c. Use P for paragraph and L for line.

1. ____ Beaches are made of sand from the erosion of rocks.
2. ____ A sand budget is only governed by the prevailing winds, tides and currents.
3. ____ Small broken waves predominately control the sand build up on the beach.
4. ____ Bores drop their sand in a small ridge known as a berm.
5. ____ During storms, wave bores, drag the sand offshore to form a sand bar.
6. ____ A groyne is a preventative measure against weathering.

Level 2 Interpretive — drawing conclusions

1. ____ Estuaries and bays act as sinks where sand is stored for later movement along the beach.
2. ____ Bays are areas of sand collection due to the bending of waves around headlands.
3. ____ A beach will not erode during a storm if the waves are absorbed by the storm bar.

Level 3 Applied — defending your opinion

Be able to give reasons (argue) why your answer is correct.

You may draw on additional information from other sources.

1. ____ Beach conservation groups should be more active in your local area.
2. ____ Developers should be allowed to build on the waterfront.

THE THREE LEVEL GUIDE

A three level guide is used to impart important information. Teachers believe that in doing work and having to justify your answer, students are more likely to remember it.

The following rules are important to make this work.

1. Absolute silence for 10 – 15 minutes during which time you are to read the article and answer True (T) or False (F) to the statements in the method section.

   You also need to justify your answer by referring to the article, e.g. P3L2 — paragraph 3 line 2 or F10.2 — Figure 137.1

2. The class is then divided up into groups of four students and you have 15 minutes to discuss your answers and arrive at a group set of answers. Make sure that democratic discussion occurs and that the group is not dominated by one or two people.

3. Finally re-group and as a class discuss the article.

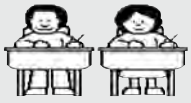


Figure 130.1 The three level guide