Explorer Education Programme

Lesson Plan: Data on the Shore
Class: Fifth / Sixth Class
Strand: Data
Strand Unit: Recognising and interpreting data

TITLE: DATA ON THE SHORE

Aim / Description:

This activity involves taking students to the seashore. (Prior to going to the Seashore, see "Planning a Field trip to the Seashore" on www.explorers.ie (http://www.marine.ie/home/community/education/Field+Trips+and+Fish+Tanks/).

Students can collect data on the shore based on the types of animals and seaweeds found there. Based on the student's prior knowledge and experience on the shore, data collection can be kept simplistic. For example, students can record data indicating:

- The number of different seaweeds and the number of individual crabs / shellfish and fish etc found on the shore.

Representing and interpreting data could also be made more comprehensive by categorising the data collected. For example, students can record the data indicating:

- The number of different brown seaweeds / green seaweeds / red seaweeds or the number of individual mussels / limpets / periwinkles etc.

The type and amount of data collected will depend on the seashore you are visiting and the type of animals and seaweeds found there.

Students should become familiar with these different groups of living things and collecting data on the numbers of each creature at different zones on the shore.

Back in the classroom, students should learn how to represent this data pictorially using bar line charts, trend graphs and pie charts.

Materials:

- Worksheet-Maths 18: Data Collection Sheet Format 1 or
  Worksheet-Maths 19: Data Collection Sheet Format 2
- Worksheet-Maths 20: Representing Data Sample
- Graph paper
- Basins / Buckets
- Nets

Explorer Education Programme

Lesson Plan: Data on the Shore
Class: Fifth / Sixth Class
Strand: Data
Strand Unit: Recognising and interpreting data

- Quadrats / Hula hoop (if using Format 1)
- Clipboard (it is useful to have a plastic sheet attached to the clipboard to keep the paper dry)
- Pencils
- Seashore Guides
- Camera , for the teacher to record what is found
- Species Guides: "Explorers species information book" and "What will I see on the seashore" and "Seashore Conservation Code" are available to download at www.explorers.ie (http://www.marine.ie/home/community/education/lessonplans/NaturalEnvironmentandEnvironmentalCare.htm)

Activity:

Step 1

- Complete a reconnaissance of the seashore prior to taking the students on the fieldtrip. Take note of:
  - The size and shape of the shore
  - The amount of rocks and seaweed on the shore

- Spend some time looking for seaweeds and animals from the top of the shore down to the bottom of the shore near the waters edge. Walk from the top of the shore (upper shore) to the bottom of the shore (lower shore) and take note of roughly how many steps it took.

- Take note of a small selection of animals and seaweeds you have found using a seashore guide or Explorers species information book and take photographs for the classroom.
  - Did you find a number of different seaweeds?
  - Did you find crabs?
  - Did you find any fish?
  - Did you find any different types of shellfish?

- Use the information collected above to decide what format to use:
  - **Format 1** – Suitable for a larger shore. Your class will work in small groups and use quadrats or hula hoops to search for animals and seaweeds at a selection of equally spaced stations (e.g. quadrats placed 2 metres apart from the upper to lower shore). This format suits a shore with lots of rocks and seaweed.
  - **Format 2** – Suitable for a small shore**.** Your class will work in small groups to look for animals and seaweeds in general areas on the shore for a set period of time: such as upper shore, middle shore, lower shore. This suits a shore with less seaweed where students can safely move around without fear of slipping

or falling. Here you will have to show students to wider areas for them to work at.

Step 2

- Prepare students for the fieldtrip by explaining the difference between seaweed, shellfish, crabs and fish. This can be done by showing the students pictures of the animals and plants found during the reconnaissance visit of the shore or by using the "Explorers species information book" or the "What will I see at the seashore guide".
- Advise them on the type of footwear (old shoes or wellies) and clothing (raincoat and hat) to wear on the fieldtrip. A change of clothing and footwear may be advisable if you will be on the shore all day.
- Decide on the groups that will work together on the shore and the format (1 or 2) they will use. Explain to students how they will collect their data by discussing the format of choice with them and showing them the data collection sheets and discuss how they will fill them in.
- Explain the "Seashore Conservation Code" to the students such as: they must respect the animals and plants at the shore; if they turn over a rock to look for animals underneath they must turn it back before going to the next rock; and how they should not pull up the seaweed on the shore.

Step 3

- Format 1: Provide groups with Worksheet-Maths 18. Start students off on the upper shore and instruct them to complete their worksheets by recording the number of individual shellfish / crabs / fish and different types of seaweeds they can find in their quadrat or on the upper shore.
- Format 2: Provide groups with the Worksheet-Maths 19. Start students off on the upper shore and instruct them to complete their worksheets by recording the number of individual shellfish / crabs / fish and different types of seaweeds they can find. Limit the time students have to search this zone on the shore.

Step 4

- Format 1: Ask students to collect data at 10 stations (points) from the upper shore to lower shore. Based on the length of the shore ask the students to measure equal distances between stations, such as 10 or 20 steps or 2 metres.
- Format 2: Move students to the middle shore to continue collecting data once their time is up on the upper shore. Repeat this process so students can collect data for the lower shore.

Explorer Education Programme

Lesson Plan: Data on the Shore
Class: Fifth / Sixth Class
Strand: Data
Strand Unit: Recognising and interpreting data

Step 5

- Back in the classroom discuss with students the animals and seaweeds that were found on the shore. Ask them if there was a difference in numbers between the different stations / zones on the shore, or between the different animals (shellfish / crabs / fish) on the shore. Ask students how they might display their data using a picture.

Step 6

- Provide students with Worksheet-Maths 20 and graph paper.
- Ask students to identify the different methods for displaying the number of different seaweeds found on the shore based on the examples given in Worksheet-Maths 20.
- Ask students to choose one method and draw one graph / chart to display their data on the number of different seaweeds.

Step 7

- Ask students to identify the different methods for displaying the numbers of shellfish / crabs / fish found on the shore based on the examples given in Worksheet-Maths 20.
- Ask students to choose one method and draw one graph / chart to display their data on the numbers of shellfish / crabs / fish.

Extension for Sixth Class

Step 8

- Ask students to choose another method for displaying their data from the examples given in Worksheet-Maths 20.
- Ask students to choose a second method and draw a new graph / chart to display the number of different seaweeds and the number of different shellfish / crabs / fish.
- Ask students to swap graphs with another group in the class.
- Ask students to read and interpret these graphs and charts and solve some simple problems such as:
    - How many crabs were found on the middle zone of the shore?
    - How many fish in total were found?
    - What was the average number of shellfish found at the stations along the shore?

Explorer Education Programme

Lesson Plan: Data on the Shore
Class: Fifth / Sixth Class
Strand: Data
Strand Unit: Recognising and interpreting data

Outcome / Objective:

The students in fifth and sixth class will have become familiar with a number of different seaweeds and animals living on the seashore. They will have collected and organised their data and should have decided on the appropriate format to display it - such as bar chart / line chart or trend graph etc. They will have developed an understanding for:

- **Recording**
- **Representing Data**
- **Interpreting Data**
- **Problem Solving**

The children in the class should have developed skills in the following:

- **Communication and expression**
- **Applying and problem solving**
- **Representing data in a number of different formats**
- **Reading and Interpretation of data**

Explorer Education Programme

Worksheet-Maths 18: Data Collection Sheet Format 1
Class: Fifth / Sixth Class
Strand: Data

Aim / Description:
This worksheet provides you with a data collection form for recording the numbers of different types of seaweeds and the number of individual shellfish / crabs / fish found at each station from the upper to lower shore. Spaces have been left for data on the different types to be recorded.

Exercise:

Group Name: Group Members: Date: Weather Conditions:											
	Upper Shore								Lower Shore		
Station Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
Number of steps between stations											
For seaweeds: count the number of different types found within the quadrat											
Seaweeds											
For animals: count the number of individuals found within the quadrat											**Total**
Crabs											
Shellfish											
Fish											

Explorer Education Programme

Worksheet-Maths 19: Data Collection Sheet Format 2
Class: Fifth / Sixth Class
Strand: Data

Aim / Description:
This worksheet provides you with a data collection form for recording the number of different types of seaweeds and the number of individual shellfish / crabs / fish found at different zones on the shore. Spaces have been left for data on the different types of any of the above to be recorded if wanted. Use a set amount of time such as 5 /10 /15 minutes to search and record the number of animals and different seaweeds in each zone. You can mark off animals as you find them and collect a small sample of the different seaweeds.

Exercise:

Group Name:
Group Members:
Date:
Weather Conditions:

	Upper Shore	**Middle Shore**	**Lower Shore**	
Number of steps between zones				
For seaweeds: count the number of different types found				
Seaweeds				
For animals: count the number of individuals found				**Totals**
Crabs				
Shellfish				
Fish				

Explorer Education Programme

Worksheet-Maths 20: Representing Data Sample
Class: Fifth / Sixth Class
Strand: Data

Aim / Description:
This worksheet provides you with an example of a completed data collection form and examples of methods to present the data pictorially using both Format 1 (pages 1 and 2) and Format 2 (pages 3 and 4).

Format 1

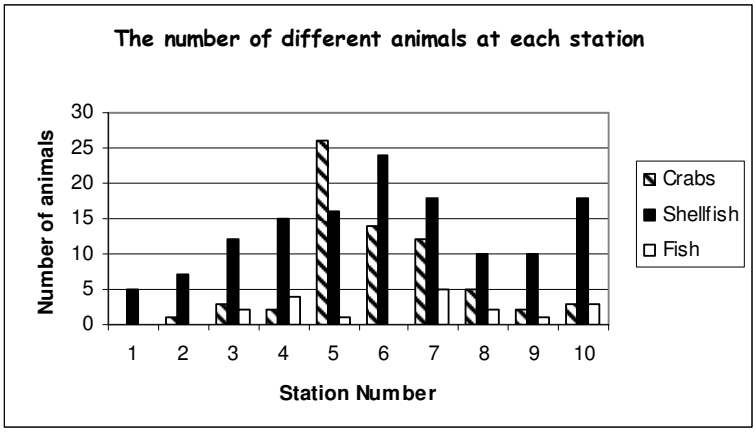
Group Name:
Group Members:
Date:
Weather Conditions:

	Upper Shore							Lower Shore		
Station Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
Number of steps between stations		*10*	*10*	*10*	*10*	*10*	*10*	*10*	*10*	*10*	
For seaweeds: count the number of different types found within the quadrat											
Seaweeds	***3***	***2***	***3***	***4***	***5***	***6***	***5***	***7***	***4***	***2***	
For animals: count the number of individuals found within the quadrat											**Totals**
Crabs	***0***	***1***	***3***	***2***	***26***	***14***	***12***	***5***	***2***	***3***	***68***
Shore crabs		*1*	*2*	*0*	*1*	*0*	*3*	*0*	*0*	*1*	*8*
Hermit Crabs			*1*	*2*	*25*	*14*	*8*	*5*	*1*	*2*	*58*
Edible Crab									*1*		*1*
Other							*1*				*1*
Shellfish	***5***	***7***	***12***	***15***	***16***	***24***	***18***	***10***	***10***	***18***	***135***
Mussels	*2*	*1*	*3*	*4*	*6*	*9*	*12*	*8*	*10*	*12*	*67*
Limpet	*1*	*5*	*4*	*6*	*3*	*3*					*22*
Periwinkle	*2*	*1*	*5*	*5*	*6*	*8*	*6*			*6*	*39*
Other					*1*	*4*		*2*			*7*
Fish	***0***	***0***	***2***	***4***	***1***	***0***	***5***	***2***	***1***	***3***	***18***
Butterfish			*2*	*4*			*2*	*1*		*2*	*11*
Blenny							*1*	*1*			*2*
Goby					*1*		*1*		*1*		*3*
Other							*1*			*1*	*2*

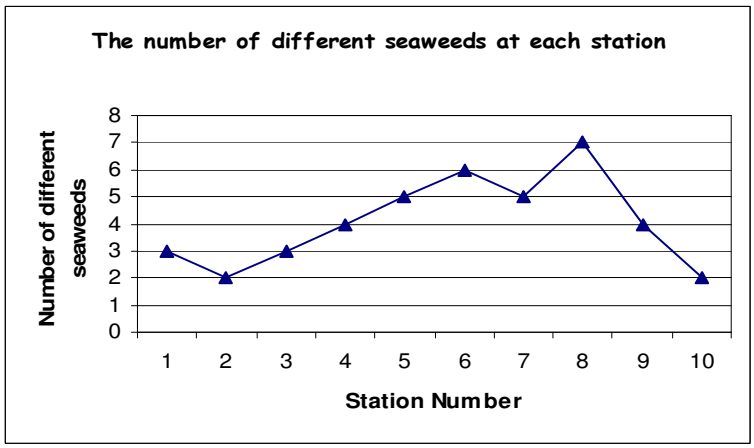
Explorer Education Programme

Worksheet-Maths 20: Representing Data Sample
Class: Fifth / Sixth Class
Strand: Data

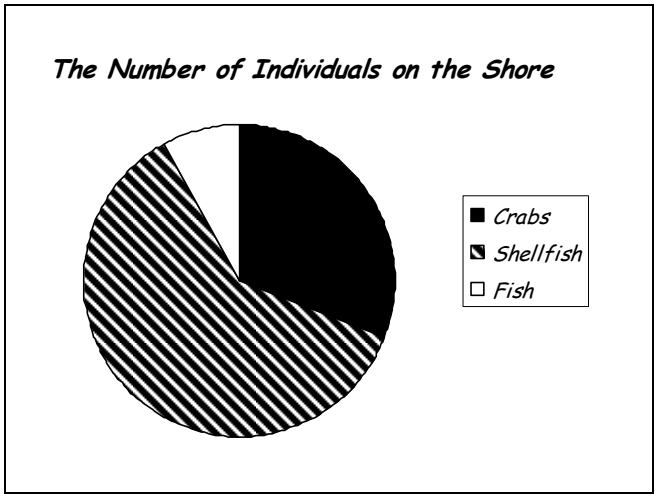
Bar Line Charts



Trend Graphs



Pie Charts



Explorer Education Programme

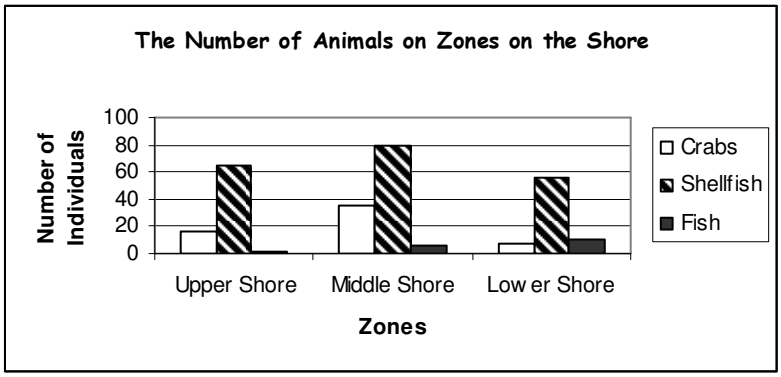
Worksheet-Maths 20: Representing Data Sample
Class: Fifth / Sixth Class
Strand: Data

Format 2

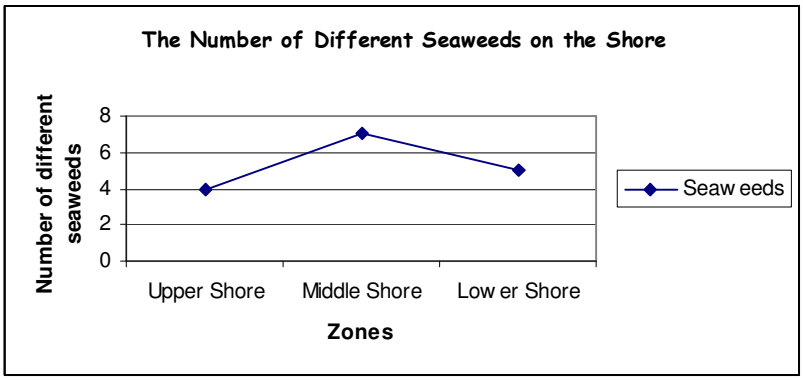
	Upper Shore	Middle Shore	Lower Shore	
Number of steps between zones		*25*	*30*	
For seaweeds: count the number of different types found				
Seaweeds	*4*	*7*	*5*	
For animals: count the number of individuals found				**Totals**
Crabs	***16***	***35***	***8***	**59**
Shore Crab	*6*	*8*	*1*	
Hermit Crab	*10*	*26*	*3*	
Edible Crab		*1*	*1*	
Other			*3*	
Shellfish	***65***	***80***	***56***	**201**
Mussels	*23*	*30*	*20*	
Limpets	*18*	*16*	*6*	
Periwinkles	*22*	*26*	*17*	
Other	*2*	*8*	*13*	
Fish	***1***	***6***	***10***	**17**
Butterfish	*1*	*4*	*6*	
Blenny		*1*	*1*	
Goby			*1*	
Pipefish		*1*		
Other			*2*	

Worksheet-Maths 20: Representing Data Sample
Class: Fifth / Sixth Class
Strand: Data

Bar Line Charts



Trend Graphs



Pie Charts