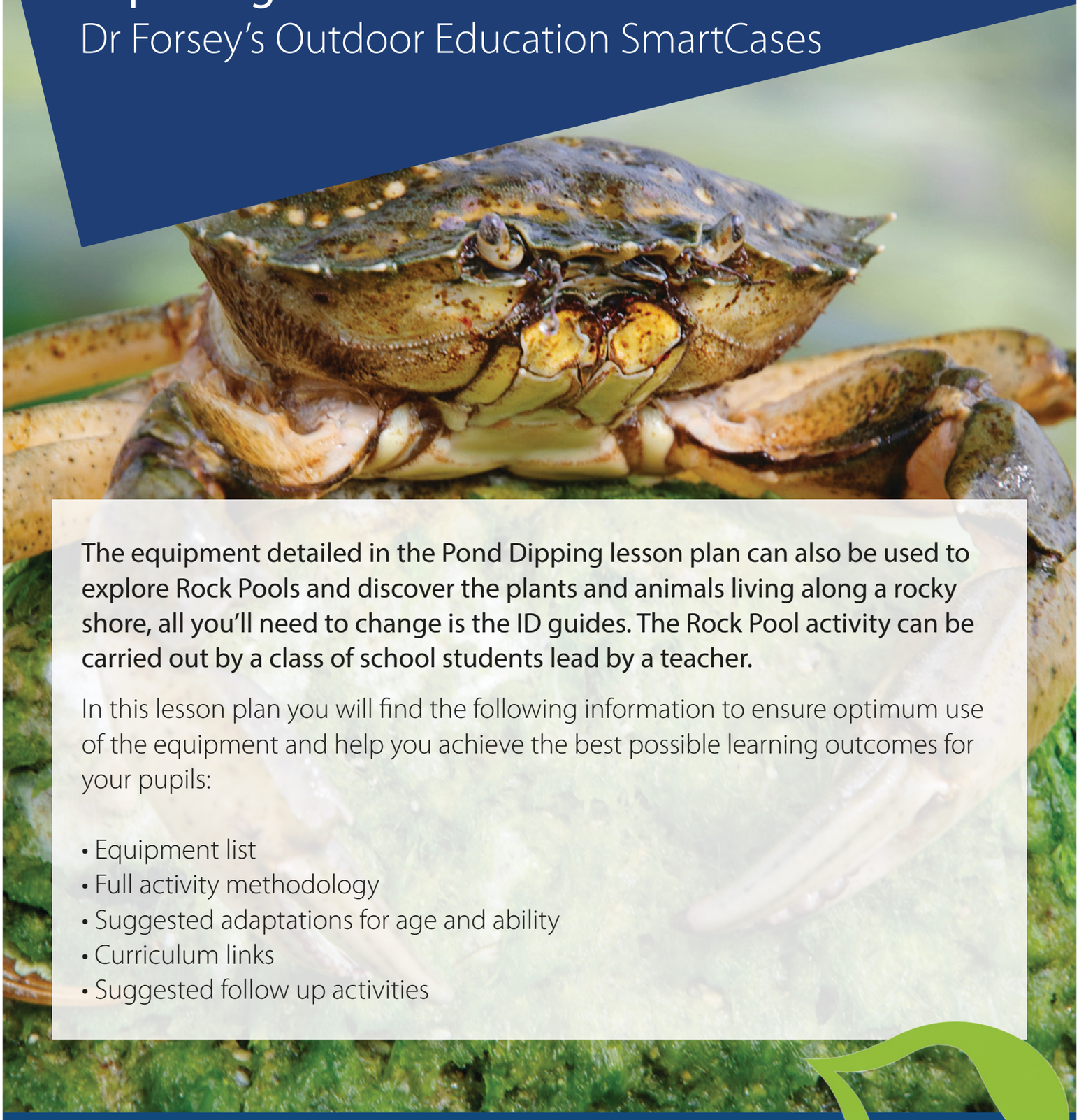
Dr Forsey's Outdoor Education
PRIMARY EDUCATION KITS
Kit 4
Exploring Rock Pools

Gratnells Learning Rooms

Exploring Rock Pools

Dr Forsey's Outdoor Education SmartCases



The equipment detailed in the Pond Dipping lesson plan can also be used to explore Rock Pools and discover the plants and animals living along a rocky shore, all you'll need to change is the ID guides. The Rock Pool activity can be carried out by a class of school students lead by a teacher.

In this lesson plan you will find the following information to ensure optimum use of the equipment and help you achieve the best possible learning outcomes for your pupils:

- Equipment list
- Full activity methodology
- Suggested adaptations for age and ability
- Curriculum links
- Suggested follow up activities

Kit list –

You will need (for a class of 30 participants working in five groups of six):

• 5 x Gratnells SmartCase
• 10 x Long handled pond net (plastic handled are lighter and easier for younger participants to manoeuvre)
• 10 x Yellow or Magnolia Shallow Gratnells (F1) tray
• 30 x Heavy duty white plastic dessert spoon
• 30 x Observation dish
(white or transparent plant pot saucers -13 cm dia. or white shallow plastic bowls work well)
• 20 x Small magnifying glass
• 10 x ID Guide of each type
1) Wildlife Watch Rockpool Detective 2) Shoreline Detective 3) Seabird spotter sheets
• 15 x Universal tubes with lid (30ml capacity)
• A rocky shore with plenty of safe, accessible rock pools
• A copy of the Coastline Code (can be found at the end of this lesson plan)

Preparation – day before the activity

• Split the equipment equally between the five Gratnells SmartCases.
• If using downloaded ID guides, print and laminate the guides and split them equally between the SmartCases or load them on to your student tablets.
• Select or design a recording sheet/card (examples shown at the end of this guide) suitable for the age and ability of the participants, print or download as required.
• Familiarise yourself with your local rocky shore and decide where you will designate as your working area. On arrival with the participants, use markers e.g. football cones (not included in kit) if no natural or man-made boundaries exist.
• Split the participants into five groups of six. Each group of six will share one SmartCase of equipment and work in two teams of three, each team of three will have their own shallow tray and net and use half of the equipment in the SmartCase. The two teams of three should work on adjacent rockpools.
• Ideally, the participants should be familiar with the kit and techniques and have carried out pond dipping activities previously. Many of the pond dipping techniques are similar to those needed for exploring rock pools.
• Students should be introduced to the Coastline Code.

Primary National Curriculum Links:

- KS1 Working scientifically
- Year 1 Animals, including humans
- Year 2 Living things and their habitats
- Year 2 Animals, including humans
- Lower KS2 Working scientifically
- Year 3 Animals, including humans
- Year 4 Living things and their habitats

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What to do

Travel to your chosen rock pool area, the participants will be able to carry their own equipment in the SmartCases.

Introduction and Demonstration (~10 minutes)
Recall the Coastline Code. Set your working boundaries with football cones or other markers, agree a muster point and ensure all participants know what to do if they get into any difficulty.

Explain that they are going to explore the rock pools and identify the plants and animals living in them. The habitat is fragile, so they must be careful and gentle. Ask them these questions while on the beach or as part of your classroom work ahead of your outdoor session….

What is a habitat?
The place where an animal lives is known as a habitat. Different animals live in different habitats. Habitats can be very big, like the arctic habitat where polar bears live, or very small such as between two blades of grass where a money spider might make its web. Remember, a habitat is just the place where the animal lives. Your house is your habitat! The rock pool is a habitat.

The rock pools will be a habitat for many creatures. Can you think what we might find?
Allow time for answers and then introduce the participants to the identification guides/spotter sheets.

Older/higher ability participants might consider how are these creatures are adapted to life in the rock pool? How do the conditions in the rock pool change over a day?
Gills, being happy living in salt water, the ability to move between rock pools or survive if the pool dries up completely, being able to tolerate changes in salinity as the rock pools dry up at low tide, the ability to defend your space in the rock pool and compete for food are all examples of adaptations.

Teacher Demonstration

• Choose a rock pool that is easy to access/observe by all participants for your demonstration. On the edge of the rocky area is good if the site allows as the participants can stand on the flat beach while you stand on the rocks to demonstrate.
• Stand between the participants and the rock pool.
• Approach the edge of a rock pool and run through the method.
• Scoop some rock pool water into your observation tray, 3cm deep is sufficient, and place it well away from the rock pool edge. There should be plenty of room to work and move around the edge without knocking into the tray or other equipment.
• It is best to kneel, sit or crouch down safely and use your hands to gently collect creatures from the rock pool, carefully turning over any small, lose rocks in the water. If you do need to use the nets, be very careful not to damage the rock pool environment.
• If nets are needed, demonstrate how to dip with the nets and describe how they must stand sideways on to the rock pool with their knees bent or kneel down next to the rock pool. Without moving closer to the rock pool, ask all the children to stand sideways on and bend their knees to practice the position.
Don't stand straight on to the rock pool bending forwards, it is easier to lose balance and slip in this position.
• Dip the net just below the surface and avoid the rocks and sand at the bottom. Explain that they if they ccidentally get lots of sand or seaweed, they should put it straight back in the rock pool and not put it in their observation trays as they won't be able to see any creatures and neither will the other participants in their group. It is important not to put the net in too deep.
• Move the net in sweeps around the rock pool 'jiggling' it gently past seaweed (many creatures like to hide here), while describing to the participants what you are doing. Explain to the participants that the creatures are not usually swimming out in the open water in the middle of the pool so there is no need to lean out over the water.
• Explain to the participants not to remove the net from the water and spend time looking into it as any creatures in there may suffer from being out of the water. They should move the net away from the pool and promptly to an observation tray.
• Empty the net carefully by turning it inside out into the observation tray and then put your net down beside the tray. Tell the participants they must allow the water to go still, so moving creatures will be easy to spot.
• If you find anything, scoop some water into one of the observation dishes and transfer the creature to the dish using the plastic spoon. Do this gently, don't tip the creatures in from height in a 'kamikaze dive' as it may harm them.
• Demonstrate the use of the ID guides or spotter sheets.
• Tell them that any creatures they find should be identified and then recorded. Show them a data sheet or tick card and, if necessary, describe what they should write on it.
• Optional - once identified, the creatures in the observation dishes could be emptied into a class communal observation tray (not included on the kit list) for reference by the teacher later.
• Tell the participants that they should not put their hands in their mouths during this activity and should wash their hands thoroughly before eating or drinking.

• If it is windy, they should trap the ID guides under the corner of the observation trays or keep them in a closed SmartCase so they don't blow away.

Activity (~30 minutes)

• Select rock pools for the participants that are shallow and have a clearly visible bottom. The participants should not stand in the rock pools but they must be able to do so safely if they slip.
• When the participants arrive at their rock pool, carrying their SmartCases and nets, they should place the nets next to the observation trays along with the observation dishes, plastic spoons and ID guide. If it is windy then keep the lids closed to prevent the ID guides from blowing away.
• Working in groups of three to an observation tray, the participants should show you the 'sideways on knees bent' position once more. They can take it in turns to approach the rock pool and collect creatures with their hands or do a sweep/jiggle with the net, once they have emptied their hands or the net into the tray the next student can repeat the process. The first student can start looking in the tray and separating and identifying the creatures while the other dips. Repeat again for the third student.
• While the participants are exploring, always stand facing them and the sea, i.e. never crouch down with your back to the water while looking into an observation tray. Move between the groups, checking on them as necessary. They should not be dipping for a second time until all the creatures in their trays have been separated and identified. Approximately 80% of their time will be spent at the observation tray and only 20% by the rock pool.
• Help to identify any creatures they find by encouraging them to find it on the ID guide themselves. They should complete their recording sheet (select recording method appropriate to the age and ability of the participants) as they go along. If you are using a class observation tray, once the creatures are identified and recorded, they can transfer their creatures to the class observation tray.
• After 20-30 minutes of work. Ask the participants to ensure their nets are clean and not full of sand or seaweed and to hand them back to you. They should complete their final separation, ID and recording before carefully emptying their separation dishes back into their observation trays and placing their equipment back into their SmartCase.
• The observation trays should be lowered into the rock pools and the contents allowed to 'swim' gently back into the rock pool with as little disturbance as possible.
• Students should collect a small sample of rock pool water in the lidded tubes to take back to the classroom if you wish to carry out the follow up activity looking for microscopic sea life. Supervise them carefully while they do this. To increase your chances of collecting some plankton and other microorganisms, squeeze the water from seaweed into the tube or gently scrape the green or brown growth from the seaweed.

Review (~10 minutes)

• If you have used one, gather the children around the class observation tray in a large circle on a flat area of the beach (use the end of one net to draw a circle in the sand to stop the children crowding in). Look at any interesting finds or good examples and test their identification skills/recollection, ask if they can say how each creature is adapted to life in the rock pool and what the creatures major anatomical feature are for.

• Finally, empty the class observation tray back into the rockpool carefully (you might want to take a picture of it first).

Other things to try...

Form a hypothesis
For older or higher ability participants, this is a great opportunity to carry out an investigation and work scientifically. One potential hypothesis is….. A shallow pool higher up the shore will have fewer types of creature living in it than a deeper pool on the middle or lower shore. Can your participants think of any other hypotheses to test? Participants can compare the results of surveying two different rock pools in different locations.

Extension activity: collect water samples in the tubes from rock pools at different distances up the beach and test the salinity (saltiness) of the water. This can be done simply with colorimetric test strips or by using a conductivity probe on your data logger.

Seasonal Change
Depending on how often you can visit the beach, you could expand the activity to investigate the effect of time of year or temperature of the water on the species found.

Microscopic rock pool life
To observe rock pool creatures often found at the bottom of the food chain and too small to see with the naked eye, take the samples of sea water collected at the end of the activity and allow them to settle. Using your own microscopy equipment, use a plastic dropper to collect a small amount from the bottom of the tube and place it into the centre of a welled slide, add a cover slip and place under a microscope. Look out for algae, zooplankton (microscopic animal life) and phytoplankton (microscopic plant life).

Food chains/web
Initiate further discussions about rock pool food chains/webs now or as a follow up in a later lesson using secondary sources of evidence. Students could research what the residents eat, and what they are eaten by, identifying which creatures are carnivores, herbivores and omnivores. There is a Beachy Food Chains game in Scottish Natural Heritage's 'Explore the Shore Beach Activity Series'. You could play this game on the beach or back in your school grounds.

Life cycles
Hermit crab, limpet and herring gull lifecycles could be further explored depending on which of these animals you spot in and around your rock pool.

Adaptation
A great set of BBC video clips on 'The Secret Life of Rock Pools' looks at adaptations for rock pool survival.

Make your own hermit crab shell
Hermit crabs usually live in the empty shells of dead snails. Sometimes they even fight another hermit crab and take their shell and swap between shells as they grow. There are some good YouTube clips of this happening. Hermit crabs have been found living in other, rather strange, homes if they can't find a nice shell. Could you make or find something that could be a good home for a hermit crab?

Share
Share photographs of your work and your finds using **#WhatsInMyTray** and **#OutdoorLearning** on social media.

Health and Safety
As with all Learning Rooms activities, you should carry out your own risk assessment prior to undertaking any activities or demonstrations. In particular, always note the tide times, check the weather conditions, carry out a preliminary site visit and conduct a site specific risk assessment prior to any costal field trip. The RNLI has a selection of free to download activity sheets and lesson plans on beach signs and dangers. Only go rock pooling on a falling tide, 1-2 hours before low tide is best. A copy of the Wildlife Trust's Coastline Code can be found at the end of this lesson plan and is a nice colouring activity prior to any beach visit.

Recording Sheets
Example ID tick card – great for younger participants – you could create your own with the creatures common to your rock pool and add pictures to aid identification/recording.

Rock Pool Tick Card

☐ Seaweed	☐ Crab	☐ Other.....
☐ Shrimp	☐ Mussel	
☐ Limpets	☐ Sea anemone	

Please see species tally chart on page 8.

Your name ..... Date:.....

Species	Tally	Total	Interesting Features
Seaweed			
Shrimp			
Limpet			
Crab			
Mussel			
Sea Anemone			
Hermit Crab			
Sea Urchin			
Jelly Fish			
Hermit Crab			
Sea Urchin			
Jelly Fish			