Invasive species

Invasive species

Teacher's pack

Topic: Invasive species

Introduction:

A non-native species refers to a species that is present in a location that it has never been in before. If this species starts to cause problems to native wildlife then it is termed an invasive non-native species. They can cause problems by out-competing local species for food or space. They may change the physical habitat or spread disease. They may even feed on the local species.

There are many different ways in which invasive non-native species can spread, depending on what it is and its life cycle. Some are purposely introduced, for example, exotic plants in gardens, some come accidentally in cargo ships, and through trade and travel. Once established they spread through the new country by wind, rivers and humans. Invasive non-natives have been identified as one of the top causes of extinctions worldwide. Invasive species have contributed to 40% of extinctions in the last 400 years.

The best solution is to stop invasive species from arriving in the first place. This is done using various methods and is called biosecurity. Biosecurity can happen on an international scale like disinfecting at airports, controls on shipping and customs inspections. On a local scale, stopping the spread and removing the invasive species before they have a chance to damage local populations is most important and can be done by cleaning and disinfecting or by physical removal of the species.

Interesting facts:

- 80% of world trade is carried by ships
- 7,000 species are transferred in ballast water every hour of every day
- In 2010 it was estimated that the annual cost of invasive species to Wales was £132,244,000
- Invasive species are the third most severe threat to European threatened species
- There are approximately 2,000 established non-native species in the UK, but they do not all pose a threat to native wildlife

Further research keywords:
Alien species, bio-control, island bio-security, ballast water, Himalayan balsam, giant hogweed, GBINNS (Great Britain invasive non-native species), carpet sea squirt, Holyhead harbour, American mink in UK, wireweed

30–45 mins

River speed

Teacher's pack

Topic: Invasive species KS: 2/3

Activity guide:

Equipment required:

- Clipboards
- Stopwatches
- Biodegradable paint (optional)
- Water safety equipment - throw line and buoyancy aid

Before arriving at the river:

1. Introduce rivers as a means of spreading invasive species throughout countries. This activity demonstrates how fast that can happen.

2. Scout out a location that offers good safe positions to start and end the race where the river is easily seen. Bridges make this a lot easier.

At the river:

1. River safety explained. Class search the area to collect sticks of similar shapes and sizes. The children measure a distance of 10m or 20m downstream. This is the recording point.

2. Spilt the class into two groups. One half of the children start upstream (preferably on a bridge).

3. The other half of the children go to the downstream recording point with stopwatches. Teacher does a countdown, the sticks are dropped into the water and the stopwatches started.

4. The stopwatches are stopped as soon as the sticks pass the children. The groups keep swapping and the experiment is repeated several times. Biodegradable paints could be used to colour code the sticks and the class divided into teams with each team only measuring their colour.

5. **This can be done in the classroom:** The average times are worked out from all the runs. The children could then use this information to work out how long things would take to travel from certain towns down to the sea or from one town to the next etc. The distances could either be supplied to the class or groups could use maps to measure the distances for themselves.

60 - 120 mins

Species survey

Teacher's pack

Topic: Invasive species KS: 2/3

Activity guide:

The survey activity can be done in two ways, either as a supervised group walk or as a take home activity that each child does with their family. The results are then discussed in the class.

Below is some information about the species listed on the survey to help start your discussions.

Grey squirrel	Himalayan balsam	Giant hogweed
Originally from Canada and the USA, introduced in the early 20th century. Grey squirrels are much larger than reds and are able to out-compete them for food and nesting sites. Greys also carry the squirrel-pox virus, which they are immune to, but is sadly fatal to reds.	First recorded in 1839, being cultivated in a greenhouse as an annual garden plant. It forms dense thickets, especially in wetlands, which alters the normal balance of the environment. Seeds drop into rivers and contaminate land downstream. The plants explosive seed release, which can send seeds into the air up to 4m away, means it can cover areas rapidly.	The earliest recorded introduction was in 1817 from its native Russia to Kew Gardens. Widely planted in fashionable gardens throughout Britain they quickly escaped and the first ('wild') population was recorded in 1828. Now widely distributed throughout Britain and Europe. They can grow up to 6m tall and **contain chemicals that can cause burns and blisters.** Their sheer size means they swamp all other plants and change the natural species present.
Rhododendron ponticum	**Japanese wireweed**	**Japanese knotweed**
First recorded in Britain, probably originating from Spain or Portugal, in approximatively 1763. Mostly used in botanical gardens and big estates. It forms very dense clumps which stop light reaching native species. Its leaves are toxic to nearly all wildlife and it is thought to carry sudden oak death disease. It is estimated that the plant now covers over 98,700 hectares in Britain.	First seen in the UK in the Isle of Wight in 1973, it has spread along the south and west coasts and has now been found in every country of the British Isles. It is a very fast growing seaweed and its 1m long frond type leaves out-compete native algae and sea grasses for light and space. It has also become a nuisance in shallow harbours and on beaches.	It is thought that Japanese knotweed first arrived in the UK in the 1840s as a specimen for botanical gardens. The thick bamboo-like stems of the plant can regrow from fragments of root left up to 2.5m under ground. Incredibly fast growing, between May and July it can add 10cm a day and can grow to 3m tall. It forms very thick patches which out-compete other plants and its strong stems can grow through man-made structures, damaging brick work and tarmac.

Species survey

Scientists monitor where and when invasive species are found all over the country. How many items on the list can you find in your local area?

Grey squirrel

Parks, gardens and woodland

Seen: ☐

Where:.....

When:.....

Himalayan balsam

River banks, wasteland and gardens

Seen: ☐

Where:.....

When:.....

Giant hogweed

Widespread especially on river banks

Seen: ☐

Where:.....

When:.....

Rhododendron ponticum

Moorland, woodand and riverbanks

Seen: ☐

Where: .....

When: .....

Japanese wireweed

Seashore, rockpools and harbours

Seen: ☐

Where:.....

When:.....

Japanese knotweed

Urban areas and gardens

Seen: ☐

Where:.....

When:.....

Giant hogweed can grow to the height of 4.5m to 6 meters.

* Remember not to touch any of the species listed above. **Giant hogweed can cause painful blisters** and touching any of the plants could help them spread!

Match it

30 mins

Teacher's pack

Topic: Invasive species KS: 3

Activity guide:

Equipment required:

- Card packs printing out
- Answer sheet printouts

Before the activity:

1. Print out the 3 pages that contain the game cards; they are labelled R_IS_1.

The activity:

1. Split class into small groups
2. Each group gets a pack of cards with 5 species, 5 effects and 5 locations
3. They work as a group to match the species, locations and effects and fill these out on their answer sheets
4. The game can be extended by putting the packs in order of distance travelled, most likely to affect the local area or talking about how they think each species was introduced - these answers could be done as a discussion with the whole class.

Answers - Match it game:

Geographical references in the species names were removed for game play. Their full names are shown below:

- Mitten crab (Chinese mitten crab)
- Destabilises river banks by creating burrows
- China

- Rhododendron ponticum
- Toxic leaves make area uninhabitable for other species
- Bulgaria, Turkey, Spain, Portugal

- Himalayan balsam
- Out-competes native species for space, light and water
- India and Nepal

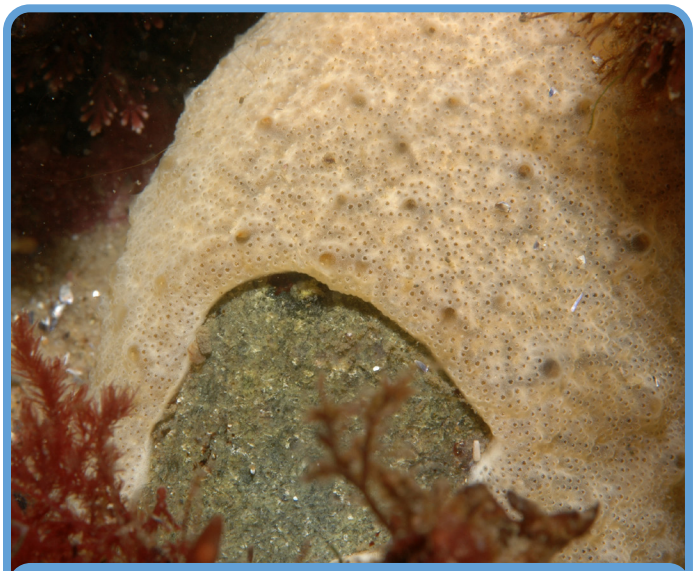
- Carpet sea squirt
- Spreads very rapidly smothering all other species
- Scientists are unsure of origin

- Mink (American mink)
- Eats bird eggs, young birds and other small animals
- USA

Mitten crab

Rhododendron ponticum

Himalayan balsam



Carpet sea squirt

Mink

Destabilises river banks by creating burrows

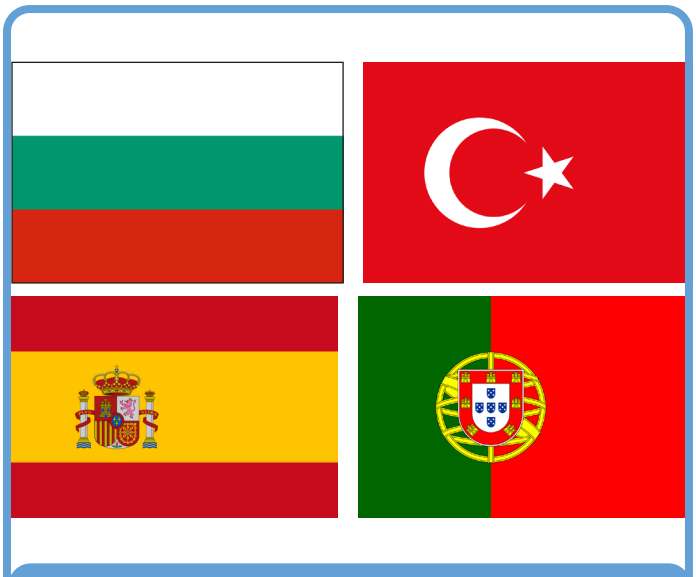
Toxic leaves make area uninhabitable for other species

Out-competes native species for space, light and water

Spreads very rapidly, smothering all other species

Eats bird eggs, young birds and other small animals

China



Bulgaria, Turkey, Spain, Portugal

India and Nepal

?

Not known

USA

Match it

Game rules: As a group, match the species to the effect it has on the environment and the country it originally came from.

1
Species: .....
Effects: .....
Comes from: .....

2
Species: .....
Effects: .....
Comes from: .....

3
Species: .....
Effects: .....
Comes from: .....

4
Species: .....
Effects: .....
Comes from: .....

5
Species: .....
Effects: .....
Comes from: .....

There are about 2.5 million grey squirrels in the UK, compared to 160,000 native red squirrels.

30 mins

Which one am I?

Teacher's pack

Topic: Invasive species KS: 2

Activity guide:

Equipment required:

- Printed worksheet
- Pens and pencils

Before starting the worksheet:

1. This works best if it is done after some introductory work on invasive species and after the other activities within this topic so that the pupils are familiar with common invasive species.

To complete the worksheet:

1. Split class into partners
2. The partners work through the sheet trying to use the clues to identify which species is being described.

Answers - Which one am I?

1) Himalayan balsam
2) American mink
3) Giant hogweed

Which one am I?

Scientists use key features to identify different species. Using the descriptive clues below, work out which invasive species they are describing and tick the right box.

1) Which one am I?

Leaves have jagged edges and a reddish middle line

- [ ] Himalayan balsam

Trumpet-shaped pink flowers that sometimes have white spots inside

- [ ] Chinese mitten crab

Bright green leaves join the stem in layers of 3 to 5 leaves each time

- [ ] Giant hogweed

2) Which one am I?

Mostly nocturnal or active at dusk

- [ ] Grey squirrel

White patches on chin and throat

- [ ] American mink

Tail between 13-23cm and covered in dark brown fur

- [ ] Chinese mitten crab

3) Which one am I?

Sharply divided and serrated leaves with bristles underneath

- [ ] Himalayan balsam

White or pinkish umbrella shaped flowers up to 80cm across

- [ ] Giant hogweed

Very tall, can grow up to 6m tall

- [ ] Japanese hogweed

Himalayan balsam can grow up to 2.5m high from seed in one summer season.