

NORWICH SCIENCE FESTIVAL

At home

PEST DETECTIVES



Hi Pest Detectives!

We are the Entomology team at the John Innes Centre. Entomology is the study of insects, and although we love learning about the bugs you can find out and about, sometimes we find them in places where we don't want them. Sometimes they are even eating the plants that are food for us! Today we need your help with something.

Our scientists have discovered three dastardly crimes committed against the plants grown for our experiments. Each plant has been damaged by an insect feeding on it and it's up to you to figure out which insect is responsible.

We have narrowed down the suspects for you and given you all of our insect knowledge about each one, including: what they like to eat, the mess they leave behind and even what their poos look like. Yuck!

Now we need you, as Pest Detectives, to put the clues together and figure out who damaged our plants. We hope you can help us and enjoy playing along.

The Entomology Team

THE RULES

The rules are simple. Use the clues on the crime sheets to match the suspect to the crime. Each crime only has one answer.

A HARDER VERSION

For a more challenging version of the game, try covering up the clues and find them yourself by looking at the photos. It's helpful to think about the information on the insect cards to know what to look for.

Crime 1 = Cabbage Stem Flea Beetle
The plant is a cabbage, so non-cabbage-eaters are excluded. Keep most plant eaters.
That damage is holes so it must be an insect.
The poo is solid.
There is NO silk present so it can't be diamond back moth.

Crime 2 = Diamond Back Moth
The plant is a cabbage, so non-cabbage-eaters are excluded. Keep most plant eaters.
The damage is holes so it must be an insect.
That damage is holes.
The poo is solid.
There are silk trails - excludes those with sticky poo.
cabbages stem flea beetle.

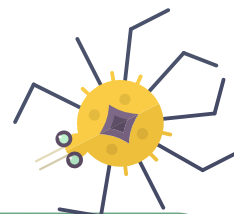
Crime 3 = Peach-Potato Aphid
The damage is a virus - must be a virus spreader.
The poo is sticky honeydew.
excludes those that poo frass.
There are distinctive skin sheds - must be an aphid.
The plant is a sugar beet - not a cereal or a grass.
excludes English grain aphid.

Answers:
DON'T LOOK UNTIL FINISHED

This activity sheet was created by Darrell Bean and Susannah Gill from the Entomology and Insectary team at the John Innes Centre.

The Norwich Science Festival at Home activity sheets were brought to you by the University of East Anglia and the Norwich Research Park. For more information, visit norwichsciencefestival.co.uk.





English Grain Aphid

Sitobion avenae



INSECT PROFILE:

- Feeds only on cereals and grasses
- Sucks sap from plants
- Poos sticky honeydew
- Can spread plant viruses
- Leaves behind tiny white skin sheds

FACT: This aphid can spread a virus that stunts the growth of cereals such as wheat and barley. This often leads to our farmers having a lower yield of

Glasshouse Whitefly

Trialeurodes vaporariorum



INSECT PROFILE:

- Feeds on various plants
- Sucks sap from plants
- Piercing and sucking mouthparts
- Tends to gather on underside of leaves

FACT: These tiny whiteflies are only 1-2mm in length. The female will often lay her eggs in neat circles, moving around the point at which she is feeding.

Leafhopper

Macrostelus quadrilineatus



INSECT PROFILE:

- Feeds on Various Plants
- Piercing Mouthparts
- Suck out plant sap
- Poos sticky honeydew

FACT: This species of leafhopper transmits at disease which changes the way the plant grows, making it produce more leafy growth instead of flowers.

Diamondback Moth

Plutella xylostella



INSECT PROFILE:

- Feeds on the cabbage family
- Caterpillars chew holes
- Caterpillars create silk trails as they move around
- Poos solid, dry frass

FACT: The moths are known to migrate in their thousands seeming to appear in huge numbers overnight and decimating crops plants.

Peach-Potato Aphid

Myzus persicae



INSECT PROFILE:

- Feeds on most plants
- Sucks out plant sap
- Poos sticky honeydew.
- Can spread plant viruses
- Leaves behind tiny white skin sheds

FACT: Aphids can get to very high numbers by making clones of themselves. This species can give birth to around 4 clones every day.

Cabbage Stem Flea Beetle

Psylliodes chrysocephala



INSECT PROFILE:

- Feeds on the cabbage family
- Chewing mouthparts
- Poos solid dry frass
- Causes characteristic holes in leaves called 'shot holing'

FACT: Named flea beetles because they have enlarged, strong, hind legs allowing them the jump great distances to avoid being eaten or to travel to new food plants.

Design a Beetle



We would love to see your beetle designs!

Tweet us a photo @JICEntomology with #NorwichSciFest

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CRIME SHEETS

1.Easier version



Crime 1

Researchers at the John Innes Centre have identified three crimes committed to the experimental plants. Pest detectives have been hired to help identify the culprits. Investigations are still ongoing.

Clue 1
cabbage plant

Clue 2
Holes in leaves

Clue 3
Solid frass (poo)



CRIME SHEETS

2.Easier version

Crime 2

Researchers at the John Innes Centre have identified three crimes committed to the experimental plants. Pest experts have been hired to help identify the culprits. Investigations are still ongoing.



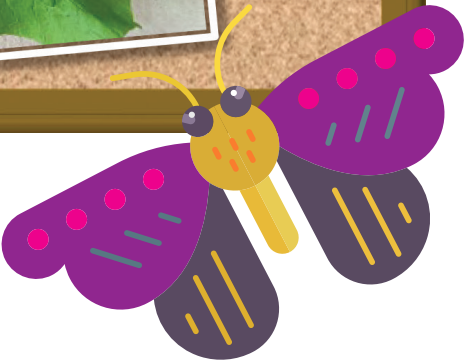
Clue 3
Silk trails around pots



Clue 2
Leaves chewed + Solid frass (poo)



Clue 1
cabbage plant



CRIME SHEETS

3.Easier version

Crime 3

Researchers at the John Innes Centre have identified three crimes committed to the experimental plants. Pest experts have been hired to help identify the culprits. Investigations are still ongoing.

Clue 1
Sugar Beet Plant

Clue 2
Yellow virus symptoms

Clue 3
Skin sheds + Sticky poo



CRIME SHEETS

1 Harder version

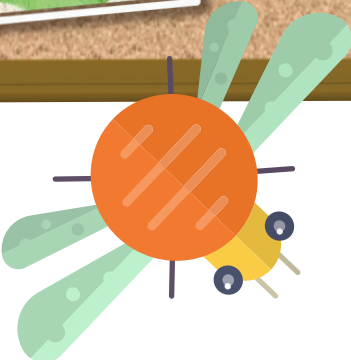
Crime 1

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Clue 1

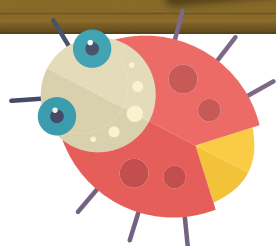
Clue 2

Clue 3



CRIME SHEETS

2 Harder version



CRIME SHEETS

3 Harder version

Crime 3

Researchers at the John Innes Centre have identified three crimes committed to the experimental plants. Pest expectatives have been hired to help identify the culprits. Investigations are still ongoing.

Clue 1

Clue 2

Clue 3

