



Asian hornet

IMPACT





2. Impact on nature and agriculture

Information for the teacher

The Asian hornet actively hunts pollinators such as honeybees, bumblebees, solitary bees, flies and wasps. It is clever and efficient: it often targets insects that live in colonies, such as honeybees and bumblebees, as this makes it easier to catch large numbers of prey quickly. This makes beehives an attractive food source for it, where it 'hoovers' in the air until prey appears.

Although honeybees are often the most visibly affected, an Asian hornet colony can capture up to 10,000 pollinators per season. This can weaken local bee populations or even cause them to disappear. This is problematic, as pollinators are essential for the fertilisation of plants, flowers, vegetables and fruit trees. Fewer pollinators mean fewer fruits, lower agricultural yields and a disrupted ecosystem. Continuous attacks can weaken or wipe out bee populations, and the survival of other pollinators may also be affected as a result. The Asian hornet is an exotic species and has no natural enemies in our region. Moreover, our native insects are not adapted to defend themselves (unlike the insects in Asia, its native habitat). The presence of the Asian hornet therefore poses a serious threat to both biodiversity and our food production, although honeybees are often the most visibly affected.

Further informations here: [What is the issue?, Vespa-Watch](#).

LEARNING OBJECTIVES

- **World Orientation & Ecology**
 - To make connections between biodiversity and agriculture.
 - To gain an understanding of ecological relationships such as predation, defence and cooperation.
 - To understand that cooperation contributes to survival, both in insects and in humans.
- **Citizenship**
 - Gain an understanding of human impact on nature and agriculture.
 - Recognising that humans can be both the cause of problems and part of the solution.
- **Mathematics & STEM**
 - Practising calculating differences, percentages and averages.
 - Learning to collect, interpret and compare data.
- **Communication**
 - Explaining findings and conclusions clearly and comprehensibly to others.





Activity 1 – Who is threatening our fruit harvest?



variable

In short

In this task, pupils learn about an expert's experiences or watch a short video. This allows them to discover first-hand the role pollinators play and the impact of the Asian hornet. By listening actively and reflecting together afterwards, they learn to make connections and apply their knowledge in real-life situations.

Necessities

- Guest speaker (bv. beekeeper, fruit famer, natureguide) or a video

Lesson structure

- Invite a beekeeper, fruit grower or nature guide, or show a video about the role of pollinators and the threat posed by the Asian hornet (e.g. the e-learning clip 'The impact of the Asian hornet on a bee colony').

Tip: Ask the speaker to show examples (e.g. a beehive, fruit with/without pollination). You can contact potential speakers yourself, for example:

- Beekeepers: [Verenigingen - Vlaams Bijeninstituut vzw](#)
- Fruit farmers: [pcfruit | Proefcentrum Fruitteelt VZW](#)
- Nature guides: [Natuuracademie | Natuurpunt](#)
- Ask the pupils to complete a listening task: 'Write down three things you learn during the conversation or video.'
- Afterwards, discuss what they have learnt so far:
 - What did they already know?
 - Was it surprising?
 - What will happen when there are less bees?
- Use a Venn diagram on the board (e.g. – hornet – beekeeper/fruit grower) to highlight the connections.
- **Optional:** Ask the pupils to conduct a newspaper interview or podcast interview for Buzz FM with the guest speaker.





Activity 2 – The impact on our agriculture



30 MIN

In short

In this activity, pupils explore the impact of the Asian hornet on agriculture, the natural world and our daily lives. By linking causes and effects, they see how a single insect can influence an entire ecosystem. In this way, they learn to think in terms of connections and understand the importance of cooperation in a fun and engaging way.

Necessities

- Worksheet 2A (cause-and-effect circle)
- Pencil or marker
- Optional: a ball of wool or thread (for the 'living' spider's web)
- Space to stand in a circle (for the interactive version)

Lesson structure

- La présence du frelon asiatique a de lourdes conséquences pour l'agriculture, et pas seulement pour la production de miel. Pour comprendre cela, les élèves peuvent utiliser la fiche 2A (voir annexe), où ils réfléchissent (collectivement ou individuellement) aux conséquences de la présence du frelon asiatique dans nos régions. Le cercle présente 12 courtes affirmations sur les causes et les effets. En reliant par des lignes tout ce qui est lié, les élèves construisent eux-mêmes une toile d'araignée de liens. Ils voient ainsi comment un petit insecte peut mettre tout un système en mouvement. Cette méthode est idéale pour :
 - Stimuler la pensée systémique
 - Visualiser des liens complexes
 - Lancer des discussions sur la nature, l'agriculture et notre rôle dans tout cela
- **Variante :** Vous souhaitez rendre l'activité un peu plus dynamique ? Vous pouvez alors transformer cet exercice en une activité de groupe en mouvement : la toile d'araignée vivante. Voici comment cela fonctionne :
 - Distribuez à chaque enfant une carte issue du cercle (cause ou conséquence).
 - Faites former aux élèves un grand cercle, en veillant à ce que chaque carte soit bien visible.
 - Un élève lit sa carte à haute voix.
 - Ceux qui pensent que leur carte est une conséquence de cette affirmation lèvent la main et expliquent le lien.
 - Si le lien est correct, lancez une pelote de laine ou un fil à cet élève, et ainsi commence la toile d'araignée.
- **Questions de réflexion :**
 - Qu'as-tu ressenti en construisant la toile d'araignée ? As-tu trouvé ça excitant, amusant, difficile... ou autre chose ? As-tu eu l'impression que tout était lié les uns aux autres ?
 - Penses-tu que les gens comprennent suffisamment l'importance des abeilles, des arbres et des fleurs ? Pourquoi, à ton avis, certaines personnes en ont-elles conscience alors que d'autres non ?
 - Connais-tu d'autres exemples montrant comment les humains et la nature sont connectés ? Que se passe-t-il pour les humains quand la nature va mal ? As-tu déjà ressenti cela toi-même ?
 - Penses-tu que nous pouvons faire plus ensemble que chacun seul ? Pourquoi la coopération est-elle importante pour résoudre des problèmes comme celui du frelon asiatique ?





Activity 3 – Bee outdoor game



50 MIN

In short

Pupils take part in an active outdoor game in which honeybees pollinate flowers and bring nectar back to the hive, whilst Asian hornets try to catch the bees.

The game demonstrates how vulnerable bees are and how cooperation increases their chances of survival. In round 2, the concept of defence is introduced via the Japanese honeybee, so that pupils learn about adaptation and cooperation in nature.

Supplies

- Worksheet 2B (game rules for teacher)
- Space to play (playground, sportfeeld) or inside (gym)
- Flowers or hula hoops spread all over the site
- Beehive (startpoint) and fruitbasket
- Fruit or alternative material (cards, pictograms) to “pollinate” flowers.
- Any markings or ribbons to set out the playzones
- Pencil/marker for scoreboard and reflection questions

Lesson structure

You can read the full rules of the game in Worksheet 2 (see appendix).

This game is designed to be played outdoors, where children not only get some exercise but also benefit from fresh air, natural light and the positive effects of nature on their well-being.

No outdoor space available? No problem. The game can also be played indoors, for example in a gym. This way, fun and exercise are guaranteed.

Tip: If you'd like to find out more about biodiversity and biodiversity webs, take a look at the GoodPlanet 'Heart for Bees' educational pack.





Activity 4 – What do I tell at home?



30 MIN

In short

Pupils write a short piece of text of 4–6 sentences in which they explain at home what they have learnt about the Asian hornet, its impact on pollinators and why this is important. The aim is to consolidate their knowledge, express it in their own words and practise their communication skills.

Supplies

- Worksheet or empty paper for the students
- Board and markers (for schedule and structure)
- If necessary, recording equipment for podcasts/small groups
- **Optional:** list with difficult words or cards with vocabulary

Lesson structure

- Start by asking the pupils: *'Imagine you come home and your parents ask, 'What did you learn today?' What would you say about the Asian hornet?'*
Let a few pupils answer spontaneously. This helps everyone get started.
- Draw a simple scheme on the board to give some structure (if necessary)
 - What is the Asian hornet?
 - What is the impact for our pollinators?
 - Why is this important?
- Let the pupils write a text of 4-6 sentences.
Help them remember:
 - Write in the first person
 - Make it sound as if you're really telling a story at home
 - Say that if they've forgotten a difficult word, to describe it in their own words
- Ask a few pupils to volunteer to read aloud in small groups or in the playground, or contribute to the podcast.
- Focus on positive feedback: *"What did you like about your classmate's text?"*





Activity 5 – Honey party



variable

In short

Pupils invite their parents to prepare a dish using honey, perhaps with a personal or cultural twist. In this way, children learn about the theme of the Asian hornet and pollinators together with their families, whilst the class discovers a variety of flavours and stories.

Supplies

- Honey and ingredients for the chosen recipes
- Optionally family recipe or a short description of the dish
- Board or wall for world map (optionally)
- Materials for pictures (for optional recipe booklet)
- Spoons, plates, napkins, table space for taste moment

Lesson structure

- Organise a honey party: invite parents to make a dish with their child where there is honey incorporated.
 - It can be as simple or extended as they want.
 - A cultural or personal touch is an advantage: a family recipe, something from their country or origin, or a vacation dish.
 - They bring the dish to their school, together with the recipe and a short story about the origin.
- Why do we do this?
 - It gives parents an active, but approachable role in this theme.
 - It makes space for cultural diversity: every family can share their own tastes and stories.
 - The tasting moment in the classroom enhances the bond between school and home.
- **Tips:**
 - Combine the tasting moment with a world map and let children prick where “their” honey recipe comes from.
 - Make a class recipe booklet with pictures of the tasting moment.





WORKSHEET 2A – The consequences for agriculture

NAME:

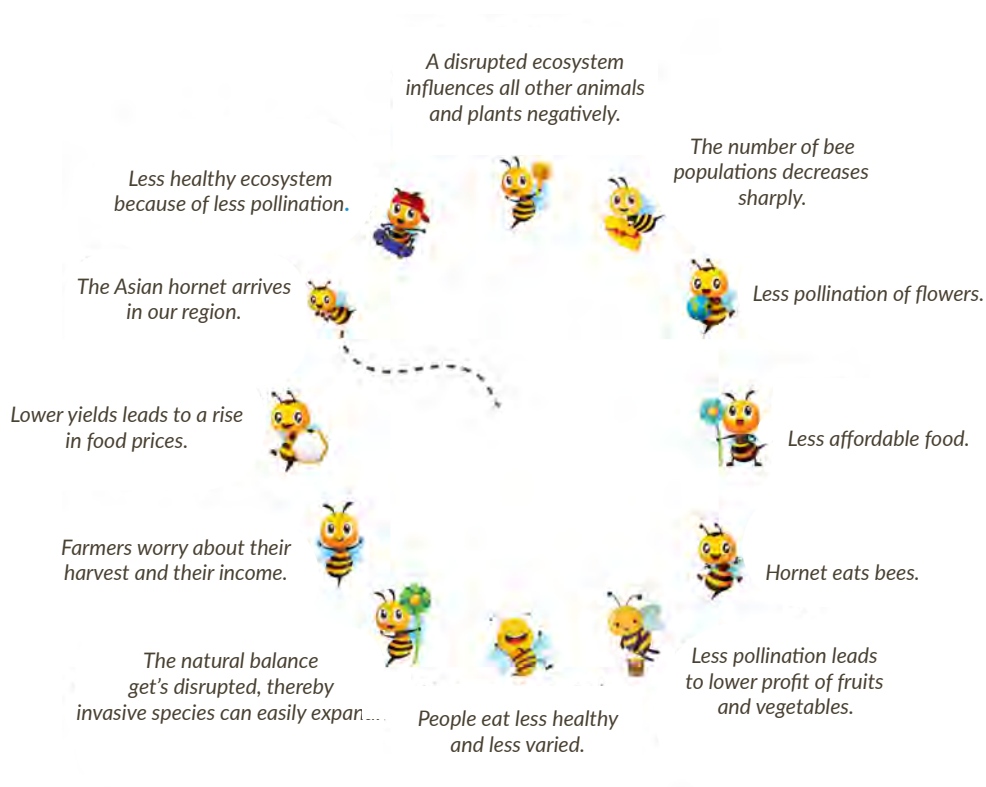
CLASS:

DATE:

The Asian hornet may seem like just a tiny creature, yet it sets off a chain of consequences. A single attack on a beehive could ultimately even have an impact on the food on your plate!

Your task: Take a close look at the 12 statements in the circle. They are all causes or consequences of one another. Draw lines between everything that is connected. Try to make as many logical connections as possible. The bigger your spider's web, the better you show the connections!

Tip: Keep asking yourself: "If this happens... what would come of it?"





WORKSHEET 2B – Game rules for ‘Bee outdoor game’ for teachers

1. Goal of the game

Honeybees try to pollinate flowers and bring their nectar back to the hive. Hornets are predators and try to catch the bees before they return. Together, we discover just how vulnerable pollinators are within the ecosystem.

2. Play space

- Draw or arrange flowers or hoops around the grounds or playground.
- A beehive (starting point) and a fruit basket are positioned to the side.
- The aim of the game is to match each flower with a piece of fruit. This fruit can be real fruit, but it can also be cards, drawings, etc.
- The game ends when all but one of the flowers have produced a fruit OR when all the honeybees have been eliminated.

3. Game rules

ROUND 1 – European honeybees

Rôles : European honeybees (~80% of the pupils) vs. Asian hornets (~20% of the pupils)

1. Bees run fast and pollinate flowers

- After touching two flowers, they may deposit a piece of fruit on the second flower and return to the hive to collect another piece of fruit.
- If the bees get tagged → return the fruit, then wait to the side.

2. Hornets can only tag bees, not each other.

3. Educational insight: Our Belgian honeybees have no effective defense strategies against the Asian hornet.

Explain how vulnerable our own honeybees are to the Asian hornet, as they lack natural defence strategies. Show how Asian hornets have adapted evolutionarily. In reality, they form a ‘bee ball’ and heat the hornet to death ([link to video](#) – in English). Our bees do not (yet) exhibit this behaviour, which makes them very vulnerable.

ROUND 2 – Asian honeybees

In this round, we introduce the **Vespa mandarinia japonica**, or the **Japanese hornet**. It really does exist and is terrifying. Measuring 5 centimetres in length, it is one of the world’s largest hornet species and is the natural enemy of the Asian hornet. Being stung by a Japanese giant hornet is no fun. The stinger is over half a centimetre long and the venom attacks your nervous system. Don’t panic, though: the Japanese hornet cannot survive in Belgium or the rest of Europe due to the dry and cold climate. In Japan, hornets live in a tropical climate.

New rules: coöperation and defence!

1. Bees:

- They can defend themselves when there are two of them → together, they can tap the hornet and take it out. Note that working in pairs is slower, as they can only take one piece of fruit per pair.
- Alone = vulnerable, but faster.

2. New player: Japanese hornet (1 pupil):

- Can eliminate all bees and Asian hornets by tagging them.
- Can not be tagged.

Educational insight: Some Asian bee species, such as the Asian honeybee, have developed defence mechanisms (e.g. forming a ball around the hornet until the temperature rises and oxygen levels become so low it kills the hornet). Asian honeybees are better able to withstand high temperatures and survive.



4. Scoreboard

CATEGORY	Round 1	Round 2	Optional questions
Fruit arranged on a bed of flowers			How many more or less flowers got succesfully pollinated in round 2?
Number of captured bees			How many percent of the bees got captured in each round?
Time until the game stopped			Which round lasted the longest? How many minutes difference is there between both rounds?
Number of hornets eliminated			In which round most of the hornets got eliminated? Why?
Efficiency			In which round did the bees work more efficient? Calculate $\text{fruit} \div \text{time}$.

5. Réflexion

- In which team did you feel the strongest?
- What was more honest or harder?
- What would happen if our bees could work together, just like the Asian honeybees do?
- Is it bad if there is a lower production of food (such as fruit) ?

