Evolution
in Action

Notes for the sensory ecology and evolution introductory slides

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On next pages you can find the topics to discuss under the each slide. Slides can be also downloaded from Lesson plan section. By adding more details and background about the evolutionary mechanisms you can adapt the introduction and workshops for your own needs and to more advanced level audience.

Evolution in Action

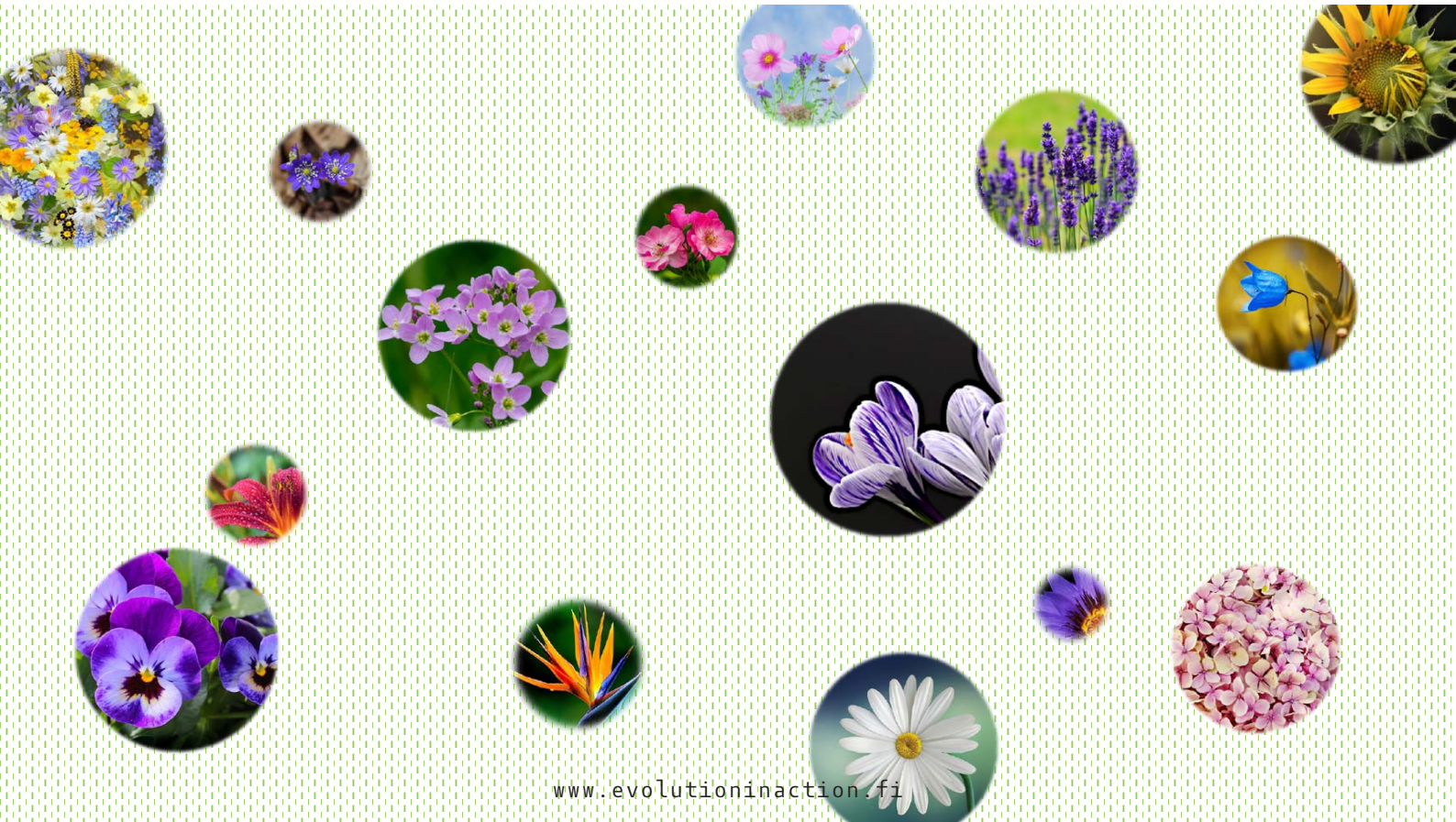
Today's task is to find out why flowers have evolved such a diverse in their colouration and form? You can first give your students a chance to brainstorm their own ideas.

To whom flowers are directed?

Slide 1

Where the colour comes from?

Pigments in flowers can be carotenoids (orange and yellow), anthosyanines (blue and red colours), white petals do not have pigment at all, but they have layer of cells that are filled with air which makes them reflect light and appear white.



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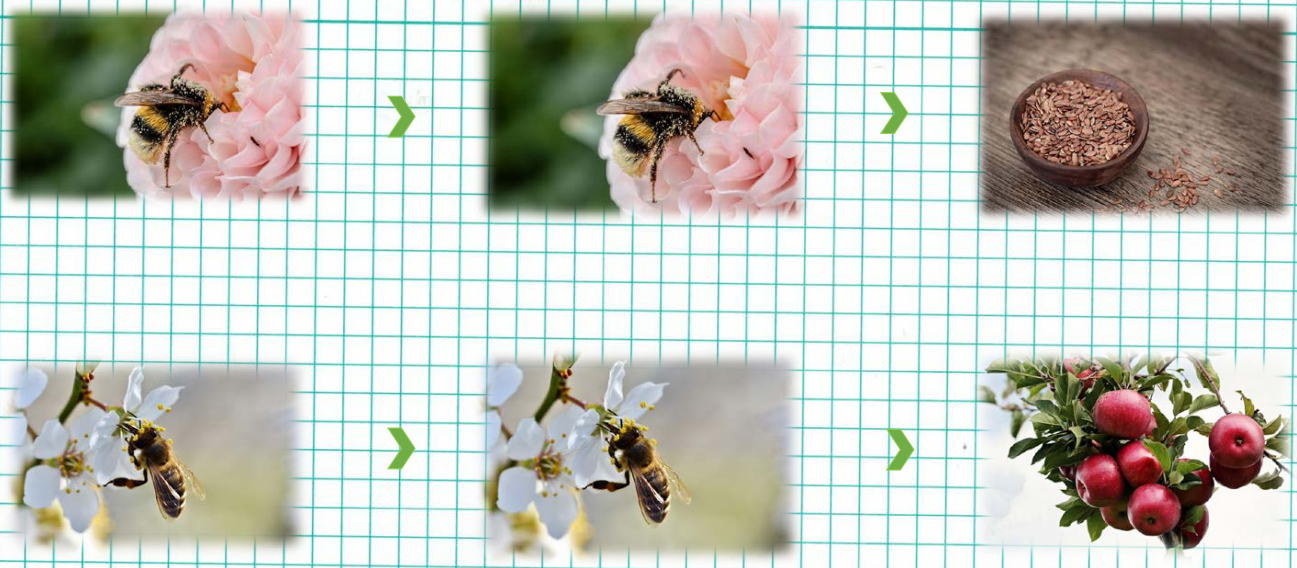
Slide 2

Why insect pollinated plants need pollinators?

Pollinators transport pollen from one flower to another. Some plants are not able to produce seeds at all without insect pollination or only small numbers of them.



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Slide 3

What pollinators gain by visiting flowers?

Nectar and pollen for food.

Who are pollinators?

We have lots of different pollinator species (e.g. Bees, wasps, flies, ants, beetles, birds, butterflies) whome flowering plants can attract with different types of colours, colour patterns and odours. Some flowers are generalist and attract all possible pollinators – some plants have evolved to attract specific pollinators which ensures that their pollen will be distributed for the flowers of the same species. For example, butterflies are more often attracted for pink and purple coloured large flowers whereas bumblebees or bees visit more often yellow and blue colours with uv-reflecting nectar guide patterns.

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Slide 4

In some cases competition among pollinators for food, competition among plants for pollinators specific to their flowers have lead for the coevolution between the plant and the pollinator. A famous example of this are malagasy orchid and its hawkmoth pollinator with an exceptionally long tongue which enables it to reach nectar that lays on
the bottom of 27 – 42 cm deep floral tube.

More about this topic can be found e.g. from here:
https://evolution-outreach.biomedcentral.com/articles/10.1007/s12052-009-0192-6#abs1

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Slide 5

Do flowers always need to smell nice?

No – it depends on the lifestyle and sensory system of whom you want to attract. For example, rotten flesh odour emitted by flowers of many stapelia – genus plants can be irresestible for flies.

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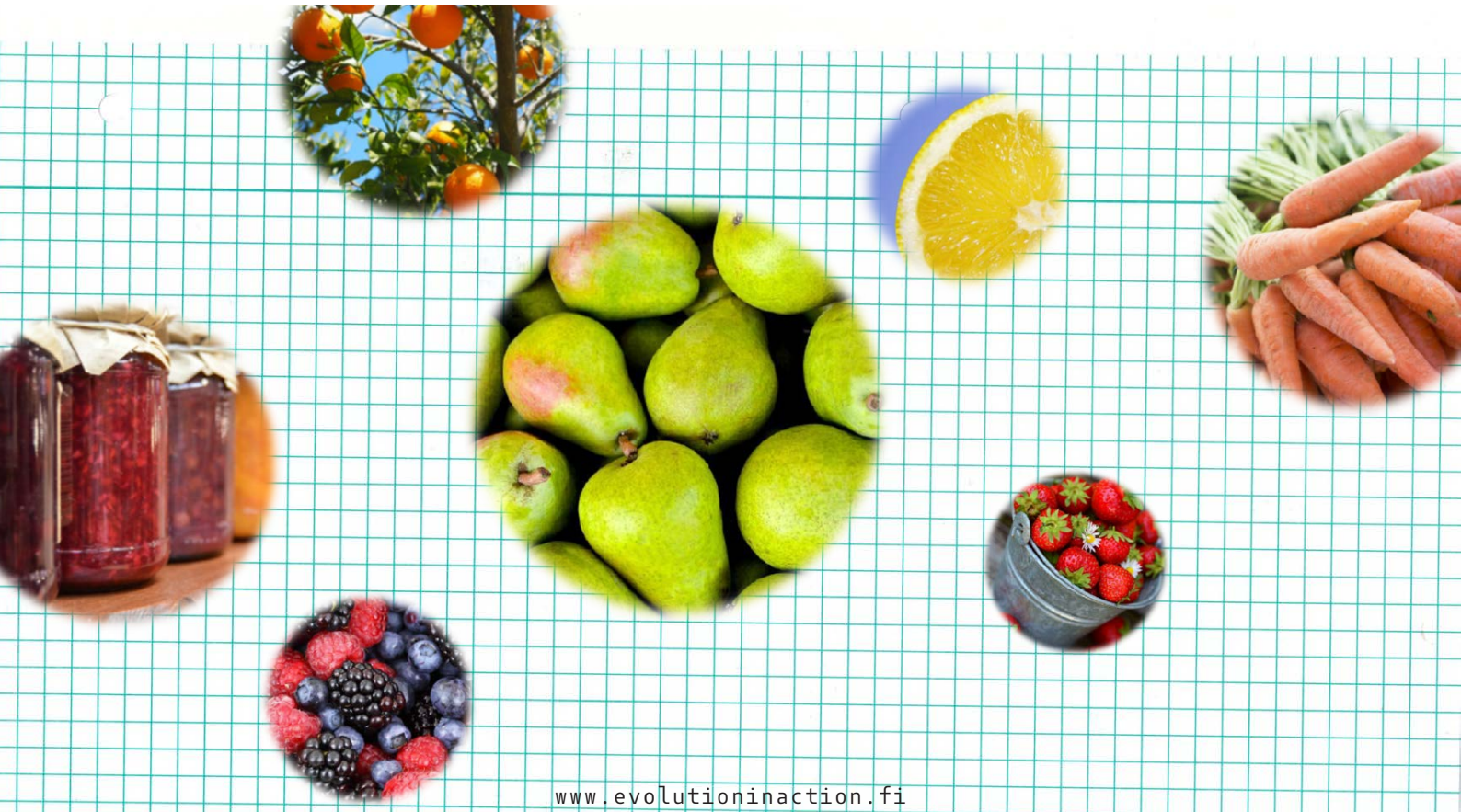
Slide 6

Why humans need pollinators?

Pollinators can survive without humans, but we humans are dependent on pollinators. 75 % of our food such as berries, vegetables and fruits harvest is dependent on the insect pollination.



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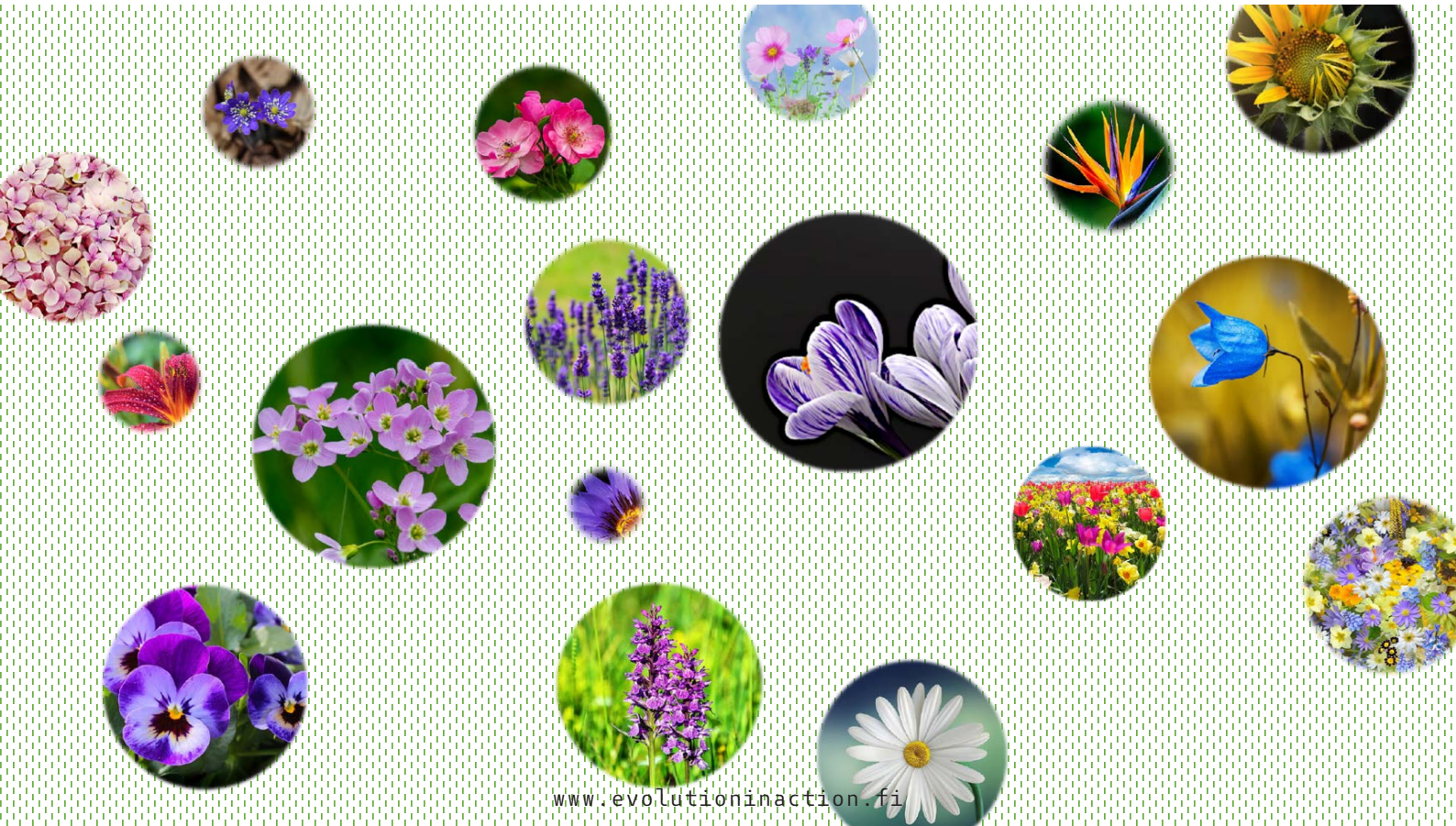
Slide 7

Back to the original question of ***how this diversity in flowers have evolved?***



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Slide 8

Let's do some research!

Now you can play pollinator game and observe flower samples collected outside with uv-flashlights.