



Name: UV light: friend or foe?

Main topic(s) that includes: The sun, Light spectrum, UV radiation and health

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Brief description (1 to 2 paragraphs): In this activity students will learn about light and UV radiation. They will understand that UV rays are very important for human health but can also pose a threat. Upon learning this, students will discover the level of awareness of their community and create strategies to raise their awareness for the benefits and dangers of UV radiation and how to behave towards it. During the process, students will learn important concepts such as the Sun, the scales in the solar system, light spectrum, how different animals see the world in different ways, etc.

Subject domain(s): Biology, physics, health

Keywords: UV radiation, Sun, Health

Didactical hours: 3 to 4 school hours

Materials needed:

- UV light sensitive beads (you can find them through amazon.co.uk with the code: B01DNHP9CU or using the keywords: "UV beads")
- The UV radiation scale: <https://idiverse.eu/wp-content/uploads/2019/04/UV-light-scale.pdf>

Possible collaborations:

Biology: Animal vision, human biology, vitamin D, Health

Environmental Sciences: UV rays and climate

Health: UV radiation and health – vitamin D, Cancer

Psychology: People's habits and relation with the Sun, depression caused by vitamin D deficiency

Physics and Astronomy: The Sun and other stars, Scales in the Universe, Light, Light spectrum

Arts: Light spectrum and colours

English: collaboration among islands of different countries requires the English language

Students' project: <https://portal.opendiscoveryspace.eu/en/osos-project/uv-radiation-friend-or-foe-853534>



General advice for teachers

- Throughout the whole activity make sure that you establish a pleasant and positive working environment;
- Help your students understand that being wrong is a very important step of the learning process;
- Ensure that your students work in heterogeneous groups with a balance between genders;
- Help the introvert students to share their opinions and thoughts;
- Make sure that all students have the same opportunities to participate in the activity;
- Never give your students the answers to the questions but guide them into finding the answers by themselves;
- Be very patient with your students, they might not be used to this type of activity yet;
- Read this document very carefully and make sure you feel comfortable with it before you introduce the activity to your students;
- Use the Inquiry-Under-the-Microscope toolkit to help your role in this activity it here: <http://platon.ea.gr/content/inquiry-under-microscope>. See the table below to understand which components can be useful in the different phases of the activity
- Good luck! 😊

Design Thinking Step	Most relevant Inquiry Components
Feel	IC1: Setting the scene IC3: Wondering about how something works IC5: Doing research and collecting data IC6: Interpreting data and drawing conclusions IC7: Comparing conclusions to hypothesis and existing theory IC9: Discussing and connecting with everyday life
Imagine	IC2: Refreshing prior knowledge IC3: Wondering about how something works IC4: Thinking about how to test hypotheses IC8: Reviewing and reflecting on what has been done
Create	IC2: Refreshing prior knowledge IC5: Doing research and collecting data IC6: Interpreting data and drawing conclusions IC7: Comparing conclusions to hypothesis and existing theory IC8: Reviewing and reflecting on what has been done
Share	IC1: Setting the scene IC2: Refreshing prior knowledge IC8: Reviewing and reflecting on what has been done IC9: Discussing and connecting with everyday life



1. Feel

During this phase you can select which of the exercises you want to leave in your students' projects. Read each of them carefully and decide if they are adjusted to your students' ages of not and adjust them.

2. Imagine

Globallab project

During this phase students are going to use a protocol integrated in a collaborative platform. This protocol has been created by the author of this activity and cannot be edited by the students. Furthermore, each student can only insert one answer to each question.

Considering this, advise your students to think about what other questions they would like to investigate, what other items to add to their survey to their families and how many people they want to interview. Then, they can register all this in their notebooks and make their own research. They introduce the answers to the predetermined questions on globallab and then create their own graphs and tables with their extra data-

Remind them to register all these details in their projects, as well as to upload their graphs and tables.

Inquiry Learning Scenario

In this phase, your students will implement an Inquiry Learning Scenario created in the graasp platform.

The goal in this scenario is that students design and experiment where they will test different ways of protection against UV radiation.

The idea is that they use the UV sensitive beads in order to see their colour after receiving the different protections. For example, if you add sun blocking cream to the beads, when exposed to direct sun light (or to the light of a UV lantern) they should not change colour. On the other hand, if you add a tanner with no sun protection, they should immediately change colour, indicating that no protection is being carried out.



Note: Students should realize that they can place the beads in different locations (sun, shade, sun but covered with trees), put different sunscreens in different sets of beads and compare their colour when exposed to the sun, place sun beads inside a room by the window and see if the colour changes, etc.

Note: Make sure that your students realize that they need to vary only one variable at a time to be able to extract valid conclusions. For example, if they put sunscreen on the beads and then put them in the shade, they won't be able to confirm if it is the sunscreen or the shade that is blocking the UV radiation. You might let them make their own experiments first and let them realize this on their own with questions that make them reflect about it or, if you need to save some time, you can straight away discuss this with them before they start experimenting.

In their project they will find [the direct link](#) for this scenario and you don't need to do any additional step.

However, if you want to have access to what your students have done in the Graasp platform, or edit the scenario for your students, you can create an account in [Graasp](#) and make a copy of the Inquiry activity by accessing this link: <https://www.golabz.eu/ils/uv-light-friend-or-foe>

1. Click preview to see what the platform will look like for your students
2. Go back to: <https://www.golabz.eu/ils/uv-light-friend-or-foe>
3. Click "duplicate space"
4. The system will generate a copy that will be yours and you will access the "backstage" of the activity.
5. Make all the changes that you want, if you want.
6. On the top right of the screen you will see the "share" button



7. Click on the button and then on "Show standalone view"
8. This will be the link you will share with your students. Make sure you give them this link or that you edit the "imagine" phase of the OSOS project, before sharing it with students, and add the correct link

Note: your students should introduce their names and in the backstage (by clicking in the icon with the shape of a person on the bar (as shown in the image above), you can scroll down and will be able to see exactly what each student does in the platform.

You can find more information here: <http://support.golabz.eu/>

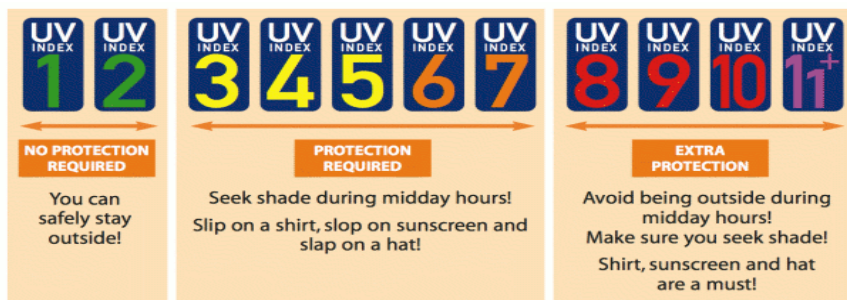


Make sure your students take pictures of their experiments, recording all their progress, and upload them to their project.

Note: In this exercise we use a standardized UV scale, to allow for the comparison of results measures by different students in different locations.

The UV Index is an internationally standardised open-ended numerical scale developed by the World Health Organization that measures the amount of UV radiation reaching the earth's surface. It begins at zero and has no upper limit. The UV Index is often represented as a number line with accompanying action statements and descriptive words which convey UV intensity. (<https://www.myuv.com.au/about-uv/>)

You can check the value of the level of UV radiation around the world in <https://www.uvlens.com/> or use a mobile app..



UV Index Mobile App



Available free from

