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Name: UV light: friend or foe? – kindergarten and primary school version

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

Brief description (1 to 2 paragraphs): In this activity students will learn about the Sun, as a star, scales in the Solar System, the Light emitted by the Sun and the light spectrum through fun and interactive activities such as the building of a spectrometer, the creation of a newton's disk, the light colour-black colour experiment, etc. Students will also involve their parents by asking them what are the benefits and the dangers of UV radiation then by bringing them knowledge on how to benefit from the positive and protect from the negative impact of UV radiation.

Subject domain(s): Biology, physics, health

Keywords: UV radiation, Sun, Health

Didactical hours: Free

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General advice for teachers

- Throughout the whole activity make sure that you establish a pleasant and positive 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 there are several activities in which you can find some ideas to explore with your little students.

1. You can introduce to your little students the sun as a star and its size compared to earth and other stars (through a video or printing a picture to show them).

Your students can then make a drawing with their size and the size of the sun, for example.

Find inspiration here

2. You can introduce them to light and colour by building a spectrometer and letting them explore different light sources and by doing the white colour / black colour experiment

You can then let them play with coloured ink and learn about colour combinations. You can introduce them to Inquiry by challenging them to create green, for example and let them explore on their own.

Find inspiration here

3. You can talk to them about the dangers of the sun and the importance of the shade, clothing and sunscreen.

Start a discussion with them about the sun and sunburns. Some of them might already know all about it, so let them speak their minds about what they already know. Then you can send a paper home with 2 or 3 questions about the topic for their parents to discuss with them and to right down their answers. This can be a starting point for the creation of a project for the students with the mission of teaching their parents about what they have learned.

Find inspiration here

Also during this phase you can bring the UV sensitive beads to the school (you can find them on Amazon in different colours and the purple ones here) and an elastic or bracelet strings. Together they can all create bracelets or necklaces to wear during the day.

Then, using the UV level scale, you can ask them to notice the colour of the beads when exposed to the sun at different times of the day and write the corresponding number in a big table on the wall.

By doing this, students will understand that during different hours the radiation level differs and that some hours are safe and others aren't.

You can also, for example, take a picture of their little hands with the bracelets in the sun at three different times of the day, add a happy face on the pictures where the beads have a colour representative of a safe UV radiation and a sad face on the pictures where the beads have a colour

representative of dangerous UV radiation, print a montage of this as a poster and put it on the wall of the classroom.

Make sure that during your discussions you also highlight the positive aspects of the UV radiation coming from the sun:

- Positive mood
- Vitamin D (immune system, fights depression, prevents cancer, etc.)

2. Imagine

During this phase your students will already know that during some hours of the day, UV levels can be dangerous. So now, they can be challenged to discover what is the best way to protect the skin from the sun. For this, they can use the sun beads and different sun creams with different protective factors.

With them, select a set of transparent tubes or cups to put the beads on.

Then ask them what different sun protections they can test. They can think, for example, of:

- Shade
- Clothes
- Sunscreen
- Glass

Then, each tube or cup will receive a different treatment.

- One set of beads can be put in the shade and another directly in the sun - compare
- One set of beads can receive sunscreen level 10 and another set level 50 – compare
- One set of beads can receive sunscreen level 50 and other be below a shirt – compare

- One set of beads can be directly in the sun and the other behind the glass of a window – compare.
- Etc.

Make sure you and your students just have fun together when making these experiments. They will certainly learn a lot from it just by the discussions you might have throughout the process.

They should understand, however, that they must test one variable at a time to know what causes the differences.

3. Create

During this phase you and your students will decide what you will create in order to bring their new knowledge to their families, or even to the community.

You can create a science trail involving this activity and others, or you can make an exhibition with students' drawings, you can make a theatre performance, etc.

It is up to you and your students, what you should create.

You can also invite the parents to the school to help with the creation. Inviting a health professional might also be interesting for your students. If possible, invite both a woman and a man in order to represent gender balance to your students.

Students can create bracelets and necklaces and offer to their families or sell them in a school fund raising fair. Etc.

4. Share

In this phase you simply share the work done by your students in the way your school sees best.

Tips to make it more noticeable:

- Share it with the IDiverSE team to be disseminated in the social media: info@idiverse.eu
- If it is an exhibition, you can even call the local newspaper of tv channel to broadcast it.
- Invite the families and ask them to share
- Etc.