

The VentiRay game

Teacher's guide

Learning objective

The VentiRay game is a serious board game. By playing the VentiRay game, students learn about radioprotection as they take on the role of a crisis manager. His task is to save as many forest animals as possible from the harmful breath of the VentiRay dragon. To reach this goal, students have to cooperate in teams **of 2 to 4 students**. Yet, in a class, you can create multiple teams, each equipped with their own board game, and let them compete to save the most forest animals. The game takes between **40 and 90 minutes** to play. However, it is **best to allow some extra time to set up the game**, as there are some components that need to be cut out (see also *How to prepare?*).

While playing the game, students learn about **radiation protection**. They become familiarized with the **core principles of radiation protection**, namely to limit the **distance** and **time** of exposure to radiation sources and to **shield** from radiation sources. While the radioactive source in the VentiRay game is a fantasy creature, i.e., the VentiRay dragon, students can easily link the game **with real-life situations**, as the game incorporates several elements from real-world situations. **Weather conditions**, particularly the wind direction, are, for example, an important element in the game, but also play an important role in the deposition of radioactive materials in real-life disaster situations. The old maps that depict contamination from radioactive materials inspired the **cone-shaped sections** in the middle of the board game. The **multiple options to rescue the forest animals**, namely by sheltering and/or evacuating forest animals or by appeasing the VentiRay dragon, are also based on real-life situations: in a crisis situation, sheltering or evacuating people is an important choice to make by the responsible authorities.

The VentiRay game instructions include some explanation of the origins of the game and components related to radiation protection. This **explanation is given in dark green frames**. As a teacher, you can refer to these frames, or you can opt to explain them yourself. The choice is up to you!

How to prepare?

1. Decide the number of teams.
2. Print one board game and instructions per team. **Additional print instructions:**
 - a. print the board game on A3 or A0 size;
 - b. print the instructions one-sided (the final two pages are cut-out templates).
3. Apart from the board game and instructions, there are some elements that are not included in the game. Ask your students to bring scissors, a pawn, and two dice.
4. Cut out the necessary game components: 22 forest animals, 12 gems, 13 resources, 17 action cards, 28 berries, and 1 VentiRay awakened card.
5. Read the instructions. You can also give some background information (see learning objective).
6. Play the VentiRay game!

How to play?

Game instructions are explained in detail in the separate document 'The VentiRay instructions'.

After playing: questions for class debate

After the game, you can organize a class debate to discuss the impact of game strategies and link some of the game elements to radiation protection. The following questions may guide the debate:

Question	Background information
<i>Which strategies could you employ to rescue forest animals?</i>	The game includes three main strategies, namely sheltering, evacuation and/or appeasing the VentiRay dragon.
<i>What strategy (sheltering, evacuation, appeasing VentiRay) did you choose?</i>	Evacuation may not always be the best option for crisis managers, as moving people (or forest animals) may expose them to radiation. In the case of a nuclear accident, in most cases, it is actually advised to stay indoors and close windows and doors so that radioactive materials cannot penetrate. By staying indoors, you protect yourself from inhaling or exposing yourself to radiation particles.
<i>Why do you think that the game developers included different strategies to rescue forest animals? How do these strategies relate to a real-life disaster situation?</i>	In a crisis situation, sheltering or evacuating people is an important choice to make by the responsible authorities. However, in the case of a nuclear power plant, efforts are also being made to stabilize the reactors.
<i>How did you lose the forest animals?</i>	By moving animals, you risk that they are hit by the VentiRay's breath. Building shelters may therefore be a better option.
<i>The wind was an important element in the VentiRay game. How did it affect your gameplay? Why do you think that wind or weather conditions are important in the case of a nuclear accident?</i>	During a nuclear accident, the weather conditions play a key role in crisis management. The wind direction, for example, influences the spread of the radioactive particles. For this reason, the wind direction is a key element in the VentiRay game. Another important element is rain or snow. These weather conditions can increase the deposition of radioactive materials on the soil.
<i>The VentiRay game allowed players to build a hospital to heal animals who were exposed to VentiRay's breath. What do you think is the impact of radiation exposure on humans' health?</i>	The health impact of radiation exposure mainly depends on the type of source, the distance to that source, and the duration of exposure. Depending on these aspects, ionizing radiation sources that emit alpha, beta, or gamma particles can cause health problems because they can affect atoms in living things and, as such, may damage genetic material or DNA. In severe cases, when people are exposed to very high levels of radiation, radiation may cause acute health effects, including skin burns or radiation sickness, but it may also cause long-term health effects, such as cancer.

Link for more educational materials on radiation protection

The VentiRay game is part of a study pack on the Fukushima nuclear accident. This study pack includes information on the Fukushima nuclear accident, its impact on society, radiation protection, and citizen science.

Interested in learning more? You can find the study pack here: <https://www.sckcen.be/en/study-pack-life-after-fukushima>.