Bloodstream Journey: White Blood Cells vs. Bacteria with AI Buddies and AI Skills

Lesson plan

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Short description: In this lesson plan, students will explore the bloodstream in VR and interact with AI Buddies (Red and White Blood Cells) to understand how the immune system works, and use AI Skills to trigger actions, control behaviors, and simulate immune responses.

Educational level: from Middle School (Grade 8, 13-14 years old)

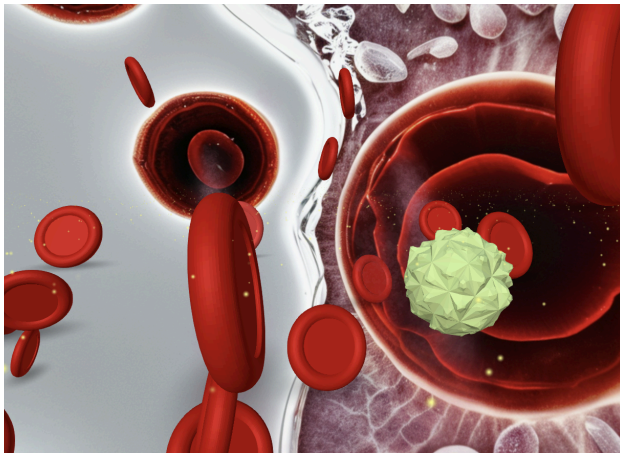
Subjects: Science (Biology), Technology (Coding/VR)

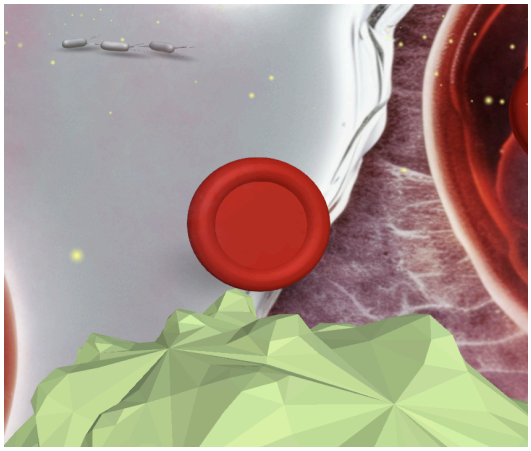
Format: Group work (3-4 students)

Assignment duration: approx.

Track A (Experience): 1-2 hours (exploration and AI interaction)

Track B (Creation): ~4 hours (modeling and programming AI Buddies & AISkills)





Project link

Introduction:

In this lesson, students immerse themselves in a 3D simulation of the bloodstream. Using Virtual Reality and Artificial Intelligence (AI Buddies and AI Skills), they interact with blood components as if they were real characters. The activity allows students to concretely visualize the body's reaction to a bacterial infection. By using commands such as **“attack”**, they can coordinate immune responses, making complex microscopic processes more concrete and engaging.

Curriculum standards:

- **Science:** Structure and function of blood; basics of the immune system

- **Technology/Informatics:** Computational thinking, use of VR simulation environments, management of conversational AI systems.

Learning goals:

- [Improve spatial skills]
- [Develop creativity]
- [Develop design skills]
- [Develop computational thinking]
- [Learn basic block-based coding]
- [Develop prompt engineering skills with AI Buddies]

Lesson structure: (for the teacher)

1. **Preparation:** Ensure access to the Delightex Edu platform and provide a short introduction to the immune system
2. **Choose the learning track:**
    a. **Track A:** Provide the link to the pre-made Project. Students explore and interact with the AI Buddies.
    b. **Track B:** Provide the empty Project template. Students model the cells and program their behaviors.
3. **Practical Activity:** Support groups during interaction with AI Buddies or during the coding phase.
4. **Debriefing:** Collective discussion on the accuracy of the AI responses and the effectiveness of the attack command.

Evaluation suggestions:

For Track A (Experience):

- **Inquiry:** Evaluate the scientific relevance of the questions asked to the AI Buddies and the ability to summarize the answers obtained.
- **Behavioral Analysis:** Evaluate students' ability to accurately describe what happens during the "infectious" phase.

For Track B (Creation):

- **Coding Quality:** Assess the logic of the block-based code, used for the “attack” action and panel management.
- **Prompt Engineering:** Evaluate the scientific accuracy of the instructions (System Prompts) entered to configure the AI Buddies.
- **3D Design:** Accuracy in modeling the cells and the generated environment.

Extension ideas:

- Introduce additional cell types (e.g., platelets) with specific functions.
- Program a "final boss" scenario (e.g. a complex virus) that requires a more articulate sequence of commands to be defeated.

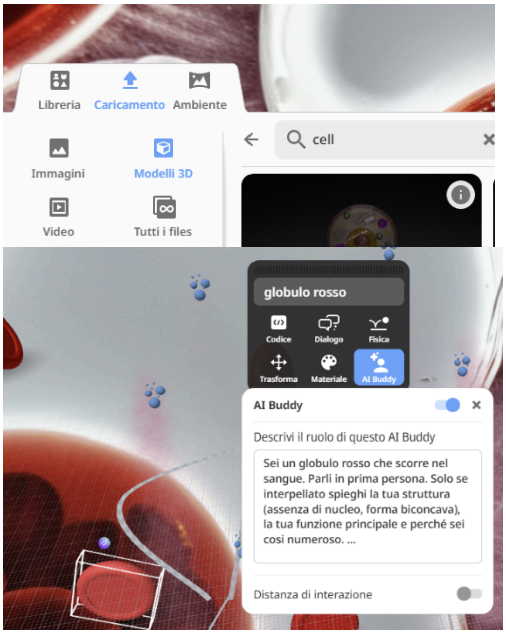
Assignment steps: (for students) Duration:

OPTION A: EXPLORATION (1-2 hours)

1. **Access:** Open the "Bloodstream Journey" Project provided by your teacher.
2. **Informative Mode:** Select "Informative" and open the chat. Ask the Red Blood Cell: "What is your role?" and the White Blood Cell: "How do you protect the body?". Take notes on the answers.
3. **Infectious Mode:** Select "Infectious". When you see the bacteria, type or use the "attack" command to activate the White Blood Cell's AI Buddy.
4. **Report:** Write a brief summary of how the AI explained its task and how it reacted to the attack. Ask the White Blood Cell's AI Buddy to explain the specific action it just performed.

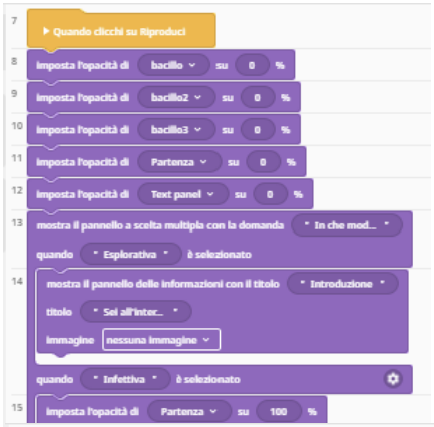
OPTION B: CREATION AND CODING (4 hours)

1. **Environment Generation:** Access the Space settings and use Delightex's internal creation feature to generate an immersive 3D environment (e.g. a "bloodstream" or "biological tunnel").

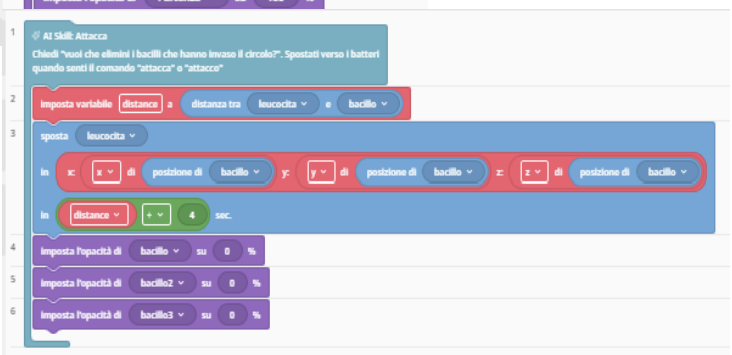


2. **Modeling:** Use the **Library** tools to search for 3D models of red blood cells, white blood cells, and bacteria, placing them within the generated environment.

3. **AI Buddies Configuration:** Assign the "AI Buddy" role to your cells. Add clear scientific instructions (e.g., "You are a red blood cell, explain how you transport oxygen").



4. **Logic Programming:** Use coding blocks to create the selection panel. Program the action: when the user chooses "Infectious," the bacteria must appear.



5. **Attack Command:** Configure a specific AISkill so that the White Blood Cell moves toward the bacteria when it receives the text command "attack."

6. **Testing:** Launch the Project and verify that the AIs respond correctly and that the defense system works as intended.