



Acting out Photosynthesis as a Ball Game

(Resource ID: 151)

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This teaching resource is allocated to following University:

BOKU - University of Natural Resources and Life Sciences Vienna

<http://sustainicum.at/en/modules/view/151.Acting-out-Photosynthesis-as-a-Ball-Game>



Group work



5 to 10 students



**Up to 3 lecture
units**



**Internet
connection
necessary**



English, German

By acting out photosynthesis as a ball game, the energy and material flows of photosynthesis are made apparent. Balls or fruits of various sizes and colors represent the atoms and molecules that the participants, according to the basic equation of photosynthesis, gather or "absorb," separate, and piece together again in new connections. Emphasis is placed on conveying the stoichiometric relations correctly, thereby increasing the actability of the exercise. The participants portray the sun as the energy source and various biochemically active substances. They cooperate according to the biochemistry of photosynthesis. The activity shows that due to the sun's energy, oxygen is released from water and hydrogen is transferred to carbon dioxide through which carbohydrates are formed. This scene depicts how plants produce oxygen in the

atmosphere and how stored solar energy serves as nutrition in the biomass of plants, animals and humans.

By acting photosynthesis out as a ball game, biochemical processes are presented in an easy-to-understand manner using people and acting materials. The transfer, separation, and joining of the balls or fruits makes substance flows more tangible and understandable. The rules of the game are defined by the biochemical background and so convey knowledge of chemistry.

A ball game with movement is a fun and unique way of conveying knowledge.

Preparation

Purchase of necessary materials

Balls can be borrowed at BOKU or obtained through the author

Supplied material

Rope or bicycle elastic straps of equal length

2-5 kg corn or 2 kg spiral noodles (Fusilli)

Balls with Velcro: oxygen, hydrogen, carbon dioxide

Description of application during the course

The acting exercise can be used in all lectures in which photosynthesis, carbon cycles, oxygen cycles, or the sun's energy as universal energy source are central topics.

The scene can be acted without knowing more than the basic equation: the theoretical background of the „rules of the game“ can also be explained to help increase understanding of the biochemistry of photosynthesis.

Aha effect for students

Life can not exist without the sun

Life on Earth is a material and energy flow

Without plants there would not exist oxygen

This building block can be combined with the building block Acting Out Cellular Respiration as a Ball Game.

Teaching Tools & Methods



Game



Simulation program



Simulation

Learning Outcomes

- To recognize that the sun as the source of vitality of nearly all living organisms;
- To grasp and explain the carbon cycle;
- To grasp and explain the oxygen cycle.

Relevance for Sustainability

- The sun is the most important energy source.
- Photosynthesis delivers oxygen and biomass and therefore the destruction of the Earth's large forest areas leads to a severe disturbance of the ecological balance.

Related Teaching Resources

No specific previous knowledge / related resources required

Preparation Efforts

Medium

Access

Free

Funded by

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