SCIENCE

8

HIDDEN WATER FOOTPRINTS

SUBJECT AREA: SCIENCE
GRADE: 8

GENERAL LEARNER OUTCOMES

Unit E: Freshwater and Saltwater Systems

Students will:

4. Analyze human impacts on aquatic systems; and identify the roles of science and technology in addressing related questions, problems and issues.

SPECIFIC LEARNER OUTCOMES

Students will:

- Analyze human water uses, and identify the nature and scope of impacts resulting from different uses.
- Identify current practices and technologies that affect water quality, evaluate environmental costs and benefits, and identify and evaluate alternatives.
- Illustrate the role of scientific research in monitoring environments and supporting development of appropriate environmental technologies.
- Provide examples of problems that cannot be solved using scientific and technological knowledge alone.

Freshwater and Saltwater Systems
"Hidden Water Footprints"

STUDENT LEARNING OBJECTIVES

Students will:

- Analyze human water uses, and identify the nature and scope of impacts resulting from different uses.
- Identify current practices and technologies that affect water quality, evaluate environmental costs and benefits, and identify and evaluate alternatives.
- Illustrate the role of scientific research in monitoring environments and supporting development of appropriate environmental technologies.
- Provide examples of problems that cannot be solved using scientific and technological knowledge alone.

ASSESSMENT

Students will provide evidence of learning by:

Creating a (group) Google Slide presentation that discusses how some of the goods we buy and use contribute to our water footprints.

MATERIALS

The Alberta Water Nexus: Energy, Food, People (1:39 Min)

Facts About Global Water Usage (2:53 min)

Where is Water? The Water Rooms #2 (6:50 min)

Water Footprint Calculator Glossary

LEARNING RESOURCES

Alberta Education Programs of Studies

TEACHER INSTRUCTIONS

Freshwater and Saltwater Systems
"Hidden Water Footprints"

Use and management of water is an ongoing global concern. Companies are becoming increasingly aware that they contribute to water scarcity and pollution. We all need to explore ways on how our water footprint can make us better water stewards.

VIEW VIDEOS AND DISCUSSIONS:

The Alberta Water Nexus: Energy, Food, People (1:39 Min)
Facts About Global Water Usage (2:53 min)
Where is Water? The Water Rooms #2 (6:50 min)

REVIEW:

Water Footprint Calculator Glossary for student understanding of water footprint terms.

STUDENT ASSIGNMENT

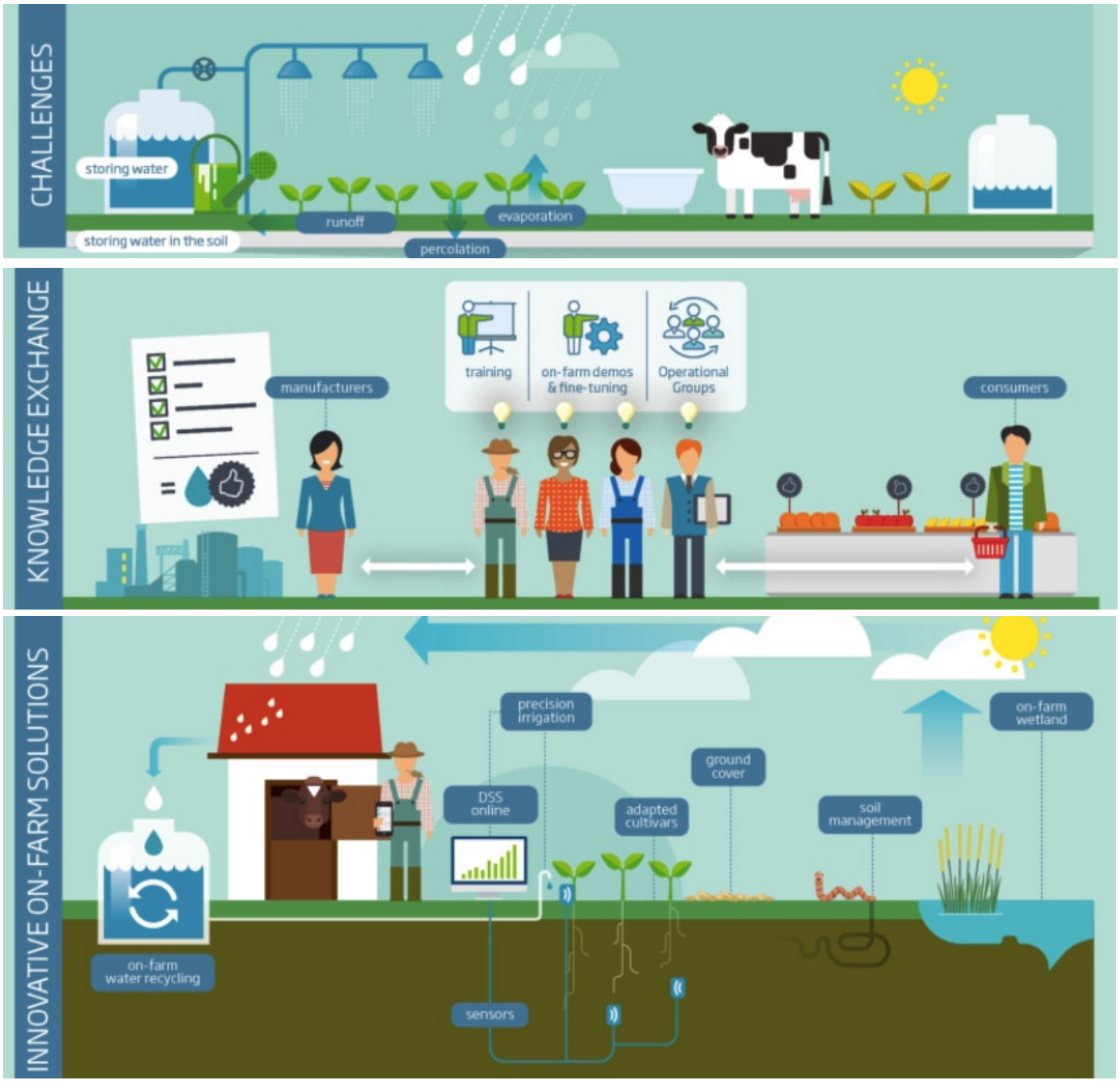
Freshwater and Saltwater Systems
"Hidden Water Footprints"

CHALLENGE QUESTIONS:

- How do some of the goods we buy and use contribute to our water footprints?
- How can we better understand what we know and don't know about an issue and what questions to ask to learn more?

SCENARIO:

You have been hired as a member of a Sustainability Team, for a company that makes the items seen in the picture of "Farmer Jim." In their effort to promote water sustainability, your company wants to redesign their products so that less water is used in their supply chain, especially by the agriculture industry in the production of the raw material they need.

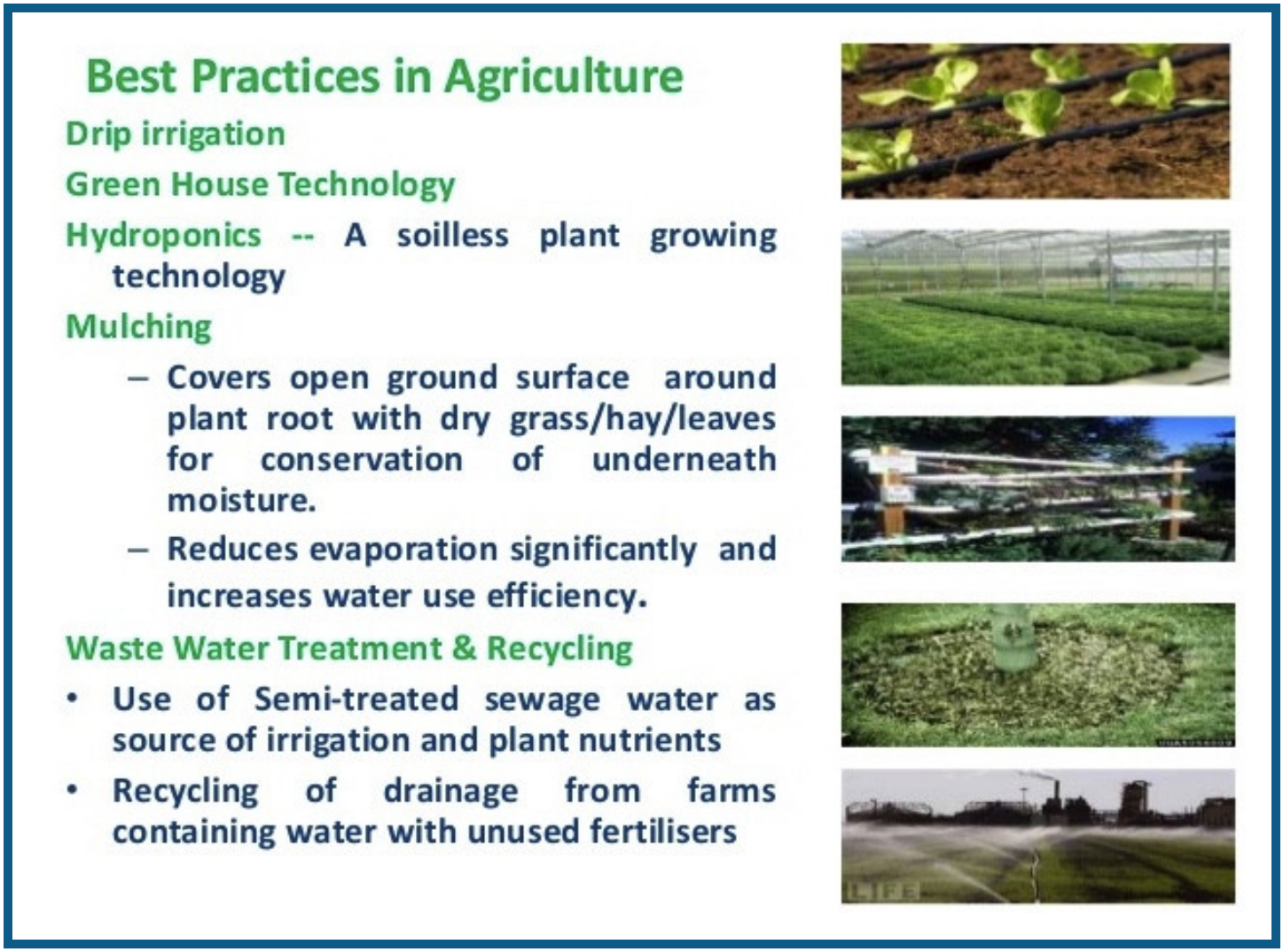


Source: https://ec.europa.eu/eip/agriculture/sites/agri-eip/files/eip-agri_infographic_water_agriculture_2016_en.jpg

ITEMS FOR REDESIGN:

- Leather boots
- Denim overalls (cotton)
- Cotton shirt
- Felt hat (wool)
- Hemp shoe laces
- Horn coverall buttons

Numerous water sustainability practices are already used in agriculture, but there is always room for the development of more.



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STUDENT ASSIGNMENT

Freshwater and Saltwater Systems
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Your "Team" (group as assigned by your teacher) must choose one of the clothing items listed to present to your supervisor (teacher).

- What do you want to know/ learn? (Brainstorm at least 5 questions) and present them to your teacher before you begin the Google Slide assignment.
- Follow the Google Slide outline as you complete the assignment for presentation.

Slide outline:

1. Title slide that fully captures the attention of the audience (include group names)
2. What do you know about the product? Make a list of your observations? (i.e. What is it made of? What is the connection to agriculture (animals or crops)? How might water use relate to each observation?)
3. Supply Chain: all of the steps involved in making the product available for the consumer purchases (Identify 3-5 steps).
4. Suggestions to reduce the water footprint in each step of the supply chain for your assigned item.For the agricultural production of the raw material you need, choose 2–3 possible solutions. This water footprint is the key focus of your assignment.
5. Bibliography slide.

- URLs must be collected for information and pictures. Use the Bibliography Slide to post URLs as your research progresses.
- Insert audio and/or video you need to further explain slide content when needed (Maximum time for presentation = 10 minutes.)

MARKING RUBRIC: Science 8 Unit E

Freshwater and Saltwater Systems

"Hidden Water Footprints"

Criteria	Excellent	Proficient	Satisfactory	Limited
Introduction — Title Slide Slide includes your group names and a catchy image	Fully captures the attention of the audience. Topic has a clear focus.	Captures the attention of the audience. Topic is focused.	Few audience members seem interested. Topic focus is vague.	Audience is not captured. No topic focus.
Organization Introduction (title slide), body content and bibliography	Present findings in an organized manner, and interesting sequences that are easy to follow.	Presents findings with some degree of organization and logical sequence that the audience can follow.	Information and graphics are placed haphazardly and students jump around content.	Audience cannot understand the presentation because there is no sequence and information is disorganized.
Content — Accuracy	Covers topic completely and in depth. All content throughout the presentation is accurate. There are no factual errors. Students demonstrate full knowledge with detailed explanations.	Includes essential information. Most of the content is accurate but there is one piece of information that might be inaccurate. Students demonstrate knowledge with content, but fail to fully explain.	Includes some essential information. The content is generally accurate but one piece of information is clearly flawed or inaccurate.	Includes little essential information. Content is typically confusing or contains more than one factual error.
Presentation	Includes 9—10 slides. Information on slides is kept short and expands on information in attached videos.	Includes 7—8 slides. Information on slides contains many sentences and student had some difficulty explaining ideas beyond the slide information and attached videos.	Includes 6 slides. Information on slides contains many sentences and has difficulty explaining ideas beyond the slide information and attached videos.	Includes less than 6 slides. Information on slides contains many sentences and does not expand on information presented in slides and attached videos.