SCIENCE - LESSON PLAN

Grade:	11-13 years old (6th-8th grade)
Subject:	SCIENCE
Lesson n°:	**3**
Topic:	**Invasive Species**
Lessons focus and goals:	This lesson aims to deepen students' awareness and understanding of the issues surrounding invasive species and their significant impact on native ecosystems. By exploring the characteristics of invasive species and their disruptive influence on biodiversity, the goal is to instill a sense of responsibility among students for the conservation of natural habitats. Emphasizing solution-oriented thinking, the lesson seeks to empower students to propose and discuss effective management strategies, promoting an active role in mitigating the spread of invasive species. The overarching objective is to encourage students to recognize their individual and collective roles in preserving the ecological balance.
Learning objectives:	**Understanding Invasive Species** Students will delve into the definition and characteristics of invasive species. They will not only grasp the concept but also identify the specific traits that categorize a species as invasive. Additionally, students will develop the ability to recognize and articulate the impact these invasive species have on native ecosystems. **Ecosystem Disruption Awareness** This objective focuses on cultivating an awareness of the disruptive nature of invasive species in local ecosystems. Students will gain insights into how these species can negatively affect biodiversity and ecological balance. Moreover, they will learn to identify the various factors that contribute to the widespread prevalence of invasive species. **Scientific Investigation of Invasive Species** Students will engage in a scientific exploration of specific examples of invasive species. This involves a detailed study of these species, including their characteristics, behaviors, and ecological impacts. Furthermore, students will develop an understanding of the scientific methods used to control and manage invasive species effectively. **Promoting Conservation Practices**

	Students are encouraged to actively participate in discussions centered around conservation practices aimed at curbing the spread of invasive species. This includes exploring and proposing strategies for preventing the introduction and proliferation of invasive species. Additionally, students will recognize and acknowledge their individual responsibilities in contributing to the broader goal of managing and mitigating the impact of invasive species on ecosystems.
Materials	- Informational resources on invasive species and conservation - Images and videos depicting invasive species - Whiteboard and markers - Projector or charts for visual aids - Printed handouts with information on invasive species - Class set of notebooks or journals
Structure and activities	**Introduction** (15 minutes) - Discuss the concept of invasive species and introduce examples of invasive species. - Show images and videos illustrating the impact of invasive species on native ecosystems. **Scientific Investigation Activity** (60 minutes) ☞ Invasive Species Study - Provide students with information on specific invasive species. - Instruct them to conduct a scientific investigation, including research on the species' origin, impact, and control methods. - Encourage critical thinking about the ecological consequences of invasive species. **Presentation** (30 minutes) ☞ Group presentation - Have each group present their findings on the assigned invasive species. - Facilitate a class discussion on the commonalities and differences between invasive species. ☞ Gallery Walk and Peer Discussion - Organize a gallery walk for students to observe and discuss each other's presentations. - Encourage questions and discussions about the methods used to control and manage invasive species. **Reflection and closing** (15 minutes) ☞ Group reflection - Gather students for a group reflection on the investigation activity.

	- Discuss what they learned about invasive species, their impact, and the importance of conservation practices. ☞ Conservation Action Plan - Ask each student to develop a conservation action plan outlining one specific action they can take to prevent the spread of invasive species in their community.
Inclusion	**Explanation of Lesson Aim and Structure:** This lesson aims to cultivate a deeper understanding of the challenges posed by invasive species while fostering a sense of responsibility for the preservation of natural habitats. Through interactive activities and discussions, students will explore the characteristics and impacts of invasive species, ultimately empowering them to propose effective management strategies. The lesson structure is designed to accommodate diverse learning styles and abilities, ensuring that all students can actively engage with the material. **Clear Instructions, Adapted as Needed:** Instructions will be communicated clearly and adapted as needed to accommodate diverse learning styles and abilities. Visual aids, such as images and videos, will be utilized to enhance understanding, particularly for students who benefit from visual reinforcement. Instructions will be reiterated as necessary, and teachers will provide individualized support to students who require additional assistance. **Formation of Inclusive Groups:** To promote collaboration and peer learning, groups will be formed with consideration for diverse abilities and backgrounds. Mixed-ability groups will facilitate cooperative learning experiences, allowing students to support one another and share their unique perspectives. Teachers will ensure that group dynamics are inclusive, fostering an environment where every student feels valued and encouraged to participate. **Monitoring Participation and Intervention Strategies:** Teachers will monitor participation closely throughout the lesson, ensuring that all students have the opportunity to contribute and engage actively. Intervention strategies will be employed if any student is observed to be disengaged or struggling. These strategies may include providing additional support, modifying tasks to better suit individual needs, or encouraging peer collaboration. Teachers will also address any instances of exclusion or discomfort promptly and sensitively, maintaining a supportive and inclusive learning environment.

Supporting Documentation/Resources:

1. **Programs:**
    a. PBS LearningMedia: PBS LearningMedia offers educational videos, lesson plans, and interactive activities on invasive species and their impacts on ecosystems. Teachers can utilize these resources to enhance their lessons on the topic.
    https://www.pbslearningmedia.org/

    b. National Geographic Kids: National Geographic Kids provides articles, videos, and interactive resources on invasive species, their spread, and their effects on native wildlife and habitats, suitable for middle school students.
    https://kids.nationalgeographic.com/

2. **Videos:**
    a. National Geographic Education: National Geographic offers videos on invasive species and related topics, featuring captivating visuals and informative narration appropriate for middle school students.
    www.nationalgeographic.org/education

    b. Smithsonian Channel: The Smithsonian Channel produces videos exploring various scientific topics, including invasive species, with engaging storytelling and expert insights suitable for middle scholars.
    https://www.smithsonianchannel.com/

    c. The Nature Conservancy: The Nature Conservancy has videos explaining invasive species and their impacts on ecosystems in an accessible and educational manner, suitable for middle school students.
    https://www.nature.org/

3. **Podcasts:**
    a. Tumble Science Podcast for Kids: Tumble is a science podcast that covers different topics, including invasive species, through storytelling and interviews with experts, making it engaging and informative for middle school students.
    https://www.sciencepodcastforkids.com/

    b. Brains On!: Brains On! is a science podcast that explores various environmental topics, including invasive species, in a fun and educational way suitable for middle school students.
    https://www.brainson.org/

    c. But Why: A Podcast for Curious Kids: But Why is a podcast where kids ask questions, and experts provide answers. They have episodes on invasive species suitable for middle school students.
    www.vpr.org/programs/why-podcast-curious-kids

Assessments:

#1 - Scientific Understanding and Presentation Skills

	Initiating	Developing	Excelling
Description of performance	Students demonstrate a basic understanding of invasive species but may provide limited details in their investigation. Presentation lacks depth and clarity.	Students exhibit an improved understanding of invasive species, incorporating more details into their investigation. The presentation shows increased depth and clarity.	Students showcase an advanced understanding of invasive species, with investigations that intricately depict the complexity of their impact. The presentation is clear, engaging, and seamlessly connects scientific understanding with real-world implications.
Sample student response	"I researched about [Invasive Species]. It's bad for the environment. Here's a presentation."	"My investigation focused on Invasive Species. It's originally from [location]. It disrupts ecosystems by [impact]. We can control it by [methods]."	"In my investigation, I delved into the intricate details of [Invasive Species]. Its origin, impact on local ecosystems, and effective control methods were thoroughly explored. The presentation not only provides scientific insights but also emphasizes the urgent need for proactive conservation efforts."

#2 - Conservation Action Plan and Critical Thinking

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	Initiating	Developing	Excelling
Description of performance	Students demonstrate a basic awareness of conservation practices to prevent the spread of invasive species but may provide a generic action plan.	Students exhibit an improved understanding of conservation practices, and their action plans show more intentional efforts to prevent the spread of invasive species.	Students demonstrate an advanced commitment to conservation practices, developing action plans that are thoughtful, strategic, and emphasize the role of individuals in preventing and managing invasive species.
Sample student response	"I will not bring plants from other places. It's good for preventing invasive species."	"I will educate my community about the dangers of [Invasive Species] and encourage them to avoid planting it. It's a small step, but awareness is key to preventing its spread."	Students demonstrate an advanced commitment to conservation practices, developing action plans that are thoughtful, strategic, and emphasize the role of individuals in preventing and managing invasive species.

Quantitative Assessment Rubric:

Criteria	Initiating	Developing	Excelling
Description of Performance			
Scientific Understanding and Presentation Skills			
- Understanding of invasive species	1-3 points	4-6 points	7-10 points
- Details in investigation	1-3 points	4-6 points	7-10 points
- Depth and clarity of presentation	1-3 points	4-6 points	7-10 points
Conservation Action Plan and Critical Thinking			
- Awareness of conservation practices	1-3 points	4-6 points	7-10 points
- Specificity and intentionality of action plan	1-3 points	4-6 points	7-10 points
- Emphasis on individual role in conservation	1-3 points	4-6 points	7-10 points

Total Points Calculation:

- Total points for each criterion can be calculated by summing up the points awarded in each category.

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Sample Student Response:

- Qualitative descriptors alongside quantitative assessments provide additional context and insight into the student's performance.
- For example, a response in the "Developing" category may be accompanied by qualitative feedback like "Shows improvement in understanding invasive species and presents a more detailed investigation. Presentation clarity could be enhanced to better communicate scientific insights."

Assessment Table: Inclusion and Diversity - Climate Change

Criteria	Check
Information offered in multiple formats	
- Variety of learning materials provided	
- Text, visual, auditory resources	
Inclusive methodologies like peer-to-peer learning	
- Opportunities for collaborative activities	
- Group discussions, peer teaching	
Use of ICT tools	
- Integration of technology in learning activities	
- Use of online platforms, interactive tools	
Overall Inclusion and Diversity	
- Integration of diverse perspectives	
- Opportunities for student engagement	
- Promotion of equitable participation	

Explanation of Criteria:

- **Information offered in multiple formats:**
  - Assess whether the lesson plan provides learning materials in various formats such as text, visuals, and auditory resources to cater to diverse learning styles.

- **Inclusive methodologies like peer-to-peer learning:**
  - Evaluate if the lesson plan incorporates inclusive methodologies like peer-to-peer learning, group discussions, and collaborative activities to encourage interaction and engagement among students.

- **Use of ICT tools:**
  - Determine if the lesson plan utilizes ICT tools such as online platforms and interactive resources to enhance learning experiences and accessibility.

- **Overall Inclusion and Diversity:**
  - Summarize the overall assessment of inclusion and diversity in the lesson plan, considering the integration of diverse perspectives, opportunities for student engagement, and promotion of equitable participation.

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