gstep
Ghana Science
& Tech Explorer Prize

Lesson 2:
Defining the Problem

DREAMOVAL FOUNDATION
Ministry of Education
REPUBLIC OF GHANA
Ghana Education Service (GES)
PARTNERSHIP BUREAU
SHULEM LAKE
Practical Education Network

Introduction

How to use the lesson plans

These lesson plans are for the use of teachers (or an adult representative), to help guide the students through the GSTEP Challenge. Lesson plans 1-6 should be completed in order.

Each lesson plan includes:

- A list of materials needed
- The learning objectives
- A lesson summary with teacher notes
- A worksheet for students to fill in (optional)

All lesson plans and supporting materials can be downloaded for free from the GSTEP Challenge website: www.gstep.org.gh.

The lesson is outlined over the next few pages. However, this is just an example schedule. You can choose the activities and lesson plans to meet the needs of your group and your timetable. You can also adapt the time spent on activities to make them shorter or longer.

Students will need paper and pens/pencils and should be guided by your instructions. Alternatively, there is a worksheet that can be printed out for students to fill in, if this is easier and you have access to a printer (no problem if not!).

Overview

Learning objectives:

- To share research on social and environmental problems, working as a group.
- To define a problem clearly.

Time:

- 40-50 minutes

Materials needed:

- Large sheets of paper (preferably A3 and/or A2 paper), plus A4 paper
- Pens/coloured pens/pencils/coloured pencils
- Lesson worksheet (optional)

Lesson Plan 2: Defining the problem

Introducing today's lesson (5 min)

Start with a brief recap of the the previous session.

Notes for teachers:
In the previous lesson, the students were introduced to the GSTEP Challenge and the three themes. Ask them if they can remember the themes.

Answer:
1. *Live healthier*
2. *Live greener*
3. *Live together*

They also identified lots of problems and narrowed down to one problem they'd like to solve. They were tasked to research this problem at home before this lesson.

Next, introduce the aims of this session.

Notes for teachers:
The aims of this session are:
- To share their research from the home activity with their groups; and
- To clearly define the problem they would like to solve.

Activity 1 (10 min): Sharing your findings

Ask the students to share what they found out from their home activity (from Lesson 1), with their rest of their group.

Notes for teachers:
In Lesson 1, students were asked to answer the following questions about a problem they identified during the classroom session:
1. Who is affected by this problem?
2. Is anyone doing anything about this problem?
3. Are there any existing solutions that aim to tackle this problem already?

They should discuss this in their groups and share their findings. If they haven't had a chance to do any further research since the last session, ask them to think about the **three** questions and speak to other members of their group about the answers.

Lesson Plan 2: Defining the problem

Activity 2 (10 min): Writing a problem statement

Ask the groups to write a problem statement about their identified problem, by filling in the gaps of the sentence below.

a. …….. *[the group of people affected by the problem]*

a. experience the problem of …….. *[describe the problem that you aim to solve].*

a. This is a problem because…….*[explain why this is a problem].*

a. Our idea will help to solve this problem by …….. *[describe how your idea will solve this problem, otherwise known as the intended outcome].*

Notes for teachers:
The main purpose of today's session is for groups to define the problem they identified in the last session, by writing a problem statement.

Problem statements help to explain what the current situation is (i.e. the problem), as well as the desired outcome (i.e. what this will look like, once the problem is solved). Writing a problem statement will help them to focus on the needs of the people affected by the problem.

An example problem statement is:
"**[Many Ghanaian children]** experience the problem of **[a lack of electricity].**
This is a problem because **[they can't do their homework at night]**.
Our idea will help to solve this problem by **[increasing access to electricity through providing low-cost alternative energy sources]**."

Activity 3 (10 min): Sharing your problem statements

Ask the groups to share their problem statements with the class. The rest of the class should share feedback on these.

Notes for teachers:
Students should be encouraged to share their problem statements with the class. This gives you the opportunity to see if they have understood the task and also give their classmates the opportunity to share their reflections.

Students should be encouraged to show support to their classmates, by being positive with their feedback. We also encourage them to share constructive feedback, but this should be done sensitively. We don't want anyone to feel discouraged!.

When giving feedback, the students should:

1. Explain what they liked about the problem statement.
2. Make recommendations to make the problem statement even better (encourage them to be as clear and specific as possible).

Activity 4 (5 min): Finalising your problem statements

Ask the groups to finalise their problem statements, based on the feedback provided.

Notes for teachers:
In their groups, students should take a few minutes to make any adjustments to their problem statements, based on the feedback given by you and the class.

You can tell them that, in the next session, they will have the opportunity to come up with some brilliant ideas to solve this well-defined problem!

Student Worksheet 2: Defining the problem

Activity 1 (10 min): Sharing your findings

Based on your home activity, please share what you found out with your group.

Note: In the last lesson, you were asked to do some research at home. Please share what you found. If you haven't had a chance to do any further research, please think about the **three** questions now and discuss these with the other members of your group.

1. **Who is affected by this problem?**

.....

.....

.....

.....

2. **Is anyone doing anything about this problem?**

.....

.....

.....

.....

3. **Are there any existing solutions that aim to tackle this problem already?**

.....

.....

.....

Student Worksheet 2: Defining the problem

Activity 2 (10 min): Writing a problem statement

Please fill out the problem statement below, based on your group discussion.

a. *[the group of people affected by the problem]*

……..……

a. experience the problem of *[describe the problem that you aim to solve].*

……

……

a. This is a problem because *[explain why this is a problem]*

……

……

a. Our idea will help to solve this problem by *[describe how your idea will solve this problem, otherwise known as the outcome].*

……

……..

Note: Problem statements help to explain what the current situation is (i.e. the problem) and the desired outcome (i.e. what this will look like, once the problem is solved). Writing a problem statement will help you to focus on the needs of the people affected by the problem.

An example problem statement is:
"**[Many Ghanaian children]** experience the problem of **[a lack of electricity].**
This is a problem because **[they can't do their homework at night]**.
Our idea will help to solve this problem by **[increasing access to electricity through alternative energy sources]**."

Activity 3 (10 min): Sharing your problem statements

Please share your problem statement with the rest of the class, and also share feedback on your classmates' problem statements.

Note: You are encouraged to show support to your classmates, by being positive with your feedback. We also encourage you to share constructive feedback, but please be sensitive. We don't want anyone to feel discouraged!

When giving feedback, you should:

1. Explain what you liked about the problem statement.
2. Make recommendations to make the problem statement even better (try and be as clear and specific as possible).

Activity 4 (5 min): Finalising your problem statements

As a group, please finalise your problem statements before the next session.

Note: In the next session, you will have the opportunity to come up with some brilliant ideas to solve this well-defined problem!

Before then, please finalise your problem statement, based on the feedback you received from your teacher and your classmates.

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