gstep
Ghana Science
& Tech Explorer Prize

Lesson 1:
Discovering a 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 learn about the GSTEP Challenge.
- To identify social and environmental problems that could be solved using Science and/or Technology.

Time:

- 30-40 minutes (plus 30 mins activity to do at home)

Materials needed:

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

Lesson Plan 1: Discovering a problem

Introducing the GSTEP Challenge (5 min)

Briefly introduce the class to the GSTEP Challenge.

Notes for teachers:

The task is to:

Create a product or solution that uses Science or Technology to make the world around you a better place.

Students will need to tackle this challenge in groups of 4-6 people, supervised by a teacher (or adult representative). The winning teams will be awarded generous prizes and gadgets for themselves and their schools! Please refer to the 'Teacher Guide' for more information. All of this information, and more, can be found on our website: www.gstep.org.gh.

Next, introduce the class to the GSTEP Challenge themes.

Live healthier: Providing people with what they need to lead happy and healthy lives, including physical health and mental wellbeing. This covers topics that relate to improving health, such as nutrition, hydration and exercise.

Live greener: Protecting the environment and saving the planet's resources. This covers topics that relate to the planet, such as climate change, conservation and waste management.

Live together: Tackling social issues and helping people to live better together. This covers topics that relate to society, such as discrimination, communication, transport and crime.

Notes for teachers:
These themes are very broad, so most problems should fit into one of these. Please encourage your class to be as creative and imaginative as possible. We want to see a wide range of different problems being identified!

Lesson Plan 1: Discovering a problem

Introducing today's lesson & getting into teams (5 min)

Introduce the aims of today's session.

Notes for teachers:
The aim of this lesson is to focus on identifying a range of problems that students could solve using Science and/or Technology.

This is because it is important to be really clear about what problem you are trying to solve, before thinking about a solution.

Next, ask the students to get into groups of 4-6 people.

Notes for teachers:
Students will need to be in groups of 4-6 people for the GSTEP Challenge (they cannot be any smaller or larger).

We will leave it to your discretion whether you put them into groups or they choose their own groups.

Either way, we highly encourage the whole class to take part. The GSTEP Challenge is open to all JHS students in the Greater Accra, Ashanti, Eastern and Volta regions!

Encourage students to pick a team name.

Notes for teachers:
All team names should be different within a class. They will have to submit this name on the application form.

Lesson Plan 1: Discovering a problem

Activity 1 (10 min): Identifying problems

Ask each group to identify some of the top problems, or challenges, that exist within their communities or the world.

Notes for teachers:
Each group should write down as many problems they can think of on their sheet of paper, under each of the **three** GSTEP thematic headings.

The purpose of this exercise is to encourage students to be clear about the problem they want to solve, before jumping straight to a solution.

When coming up with new ideas, products or solutions, people often start by thinking about the potential solution straight away. However, in fact, research shows that it's much more effective to start with the problem.

Activity 2 (5 min): Prioritising problems

Ask each group to identify which one of these problems, or challenges, they would like to solve most, and why.

Notes for teachers:
To help the students work out which of these problems they would like to focus on, you can share a few prompt questions including:

- Do you think any of these problems are especially important to solve?
- Do you really care about any of these problems?
- Can you personally relate to any of these problems, based on your own experiences?

Activity 3 (5 min): Sharing your ideas

Ask the groups to share their chosen problem with the class.

Notes for teachers:
We want to hear about as many different problems as possible.
Are groups sharing similar problems? If so, we suggest you challenge them to pick a different idea from their list.

ACTIVITY TO DO AT HOME

Activity 4 (30 minutes): Researching the problem

Ask students to answer the following questions about the problem they would like to solve in their group.

1. Who is affected by this problem?
2. Is anyone doing anything about this problem?
3. Are there any existing products or solutions that aim to tackle this problem already?

Notes for teachers:
Now that the students have identified a problem within a GSTEP Challenge theme, they should be encouraged to go away and research this problem, answering the three questions above. This will make the exercise in Lesson 2 much easier!

To find answers, we encourage students to talk to their family and friends about these questions. The information could also be found from books.

If they have access to the Internet, they might also find it helpful to use a search engine, such as Google.

Student Worksheet 1: Discovering a problem

Welcome to the GSTEP Challenge! We're so pleased you're taking part in this exciting competition. Don't forget, the winning teams will be awarded cash prizes and gadgets!

In this first lesson, you will be guided to identify some problems that you'd like to solve.

When coming up with new ideas, products or solutions, people often start by thinking about the potential solution straight away. However, in fact, research shows that it's much more effective to start with the problem.

Your challenge

Create a product or solution that uses Science or Technology to make the world around you a better place.

The GSTEP Challenge themes

Your idea should link to one of these themes:

Live healthier:
Providing people with what they need to lead happy and healthy lives, including physical health and mental wellbeing. This covers topics that relate to improving health, such as nutrition, hydration and exercise.

Live greener:
Protecting the environment and saving the planet's resources. This covers topics that relate to the planet, such as climate change, conservation and waste management.

Live together:
Tackling social issues and helping people to live better together. This covers topics that relate to society, such as discrimination, communication, transport and crime.

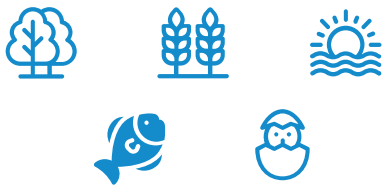
Student Worksheet 1: Discovering a problem

Team name: .....

Activity 1 (10 min): Identifying problems

What are some of the top problems, or challenges, that exist within your community or the world?

Note: You should be answering this question in groups of 4-6 people.
These themes are very broad, so please be as creative and imaginative as possible. The images below give you a few ideas, but don't be limited by these. We want to see a wide range of different problems being identified… the more unusual, the better!

Live healthier	Live greener	Live together
		
•	•	•

Activity 2 (5 min): Prioritising problems

Which one of these problems, or challenges, would your group like to solve most, and why?

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Note: Here are some prompt questions, which might help you answer this question:

- Do you think any of these problems are especially important to solve?
- Do you really care about any of these problems?
- Can you personally relate to any of these problems, based on your own experiences?

Activity 3 (5 min): Sharing your ideas

Please be ready to share this problem with the rest of the class, if your teacher asks you to.

Note: We want to hear about as many different problems as possible. Is the problem you chose the same as other groups in your class?

If so, we'd encourage you to pick a different idea from your list, as we want to hear about a wide range of challenges.

ACTIVITY TO DO AT HOME

Activity 4 (30 min): Researching the problem

Please answer the following questions about the problem your group would like to solve.

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

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

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.....

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

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Note: We'd really encourage you to speak to your families and friends about these questions. This will really help you in Lesson 2. You may also find answers from books. If you have access to the Internet (no problem if you don't!), you might also find it helpful to use a search engine, such as Google.

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