GENERAL EDUCATION CERTIFICATE

INTEGRATED PROJECTS

21st-Century teachers and teaching methodologies

Agenda

PART ONE
Context: Overview of the projects

PART TWO
Practical: Being 21st-Century Leaders and educators
World Café

Examples of 21st-Century Skills

Communication

Conflict resolution

Self-efficacy

Adaptability

Self-Efficacy

Empathy

Intrinsic motivation

Systems thinking

Accountable

Collaboration

Resilience

Emotional Intelligence

Self-directed

Computational thinking

Information literacy

Critical thinking

Problem solving

Adaptability

Growth Mindset

Compassion

Creativity

Agency/Autonomy

Curiosity

Metacognition

Digital literacy

Innovation

Leadership

Solution seeking

Decision making

Logical reasoning

Environmental awareness

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3 ENTREPRENEURSHIP
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Our students develop twenty-first-century skills through PBL that will aid them in becoming productive members of a global society. Many of these skills are not measureable through standardized tests. We must shift our thinking about assessment when teaching twenty-first-century skills. With PBL, assessment is authentic. We measure a child's performance via rubrics, but a critical aspect of this model includes self-evaluation and reflection. Children learn from their processes. They reflect on how well they worked in a collaborative group and how well they contributed, negotiated, listened, and welcomed other group members' ideas. Students also self-evaluate their own projects, efforts, motivations, interests, and productivity levels. Students become critical friends by giving constructive feedback to each other, which helps them become aware of their own strengths and improve on their interactions with each other.

Bell, Stephanie. (2010). Project-Based Learning for the 21st Century: Skills for the Future. The Clearing House. 83. 39-43. 10.1080/00098650903505415.

A new generation project:

Watch the Ascent of Money documentary, make a summary and create slides to present the content and highlights in class:

What countless students did:

1. Ask ChatGPT to summarize the Ascent of Money episodes in 500 words.
2. Ask ChatGPT to change the 500 word summary into a university level presentation script
3. Go to Tome (AI generated slides), ask to generate slides on the Ascent of Money episodes
4. BOOM! This literally saved use hours

Skills you need to navigate:

1. You must **iterate** until you have something that is worthwhile. In ChatGPT you can ask unlimited questions for re-generations of the same request. You must get creative and not give up too early.
2. You have to be **very specific, for example**: Don't ask for a summary van Ascent of Money, ask for a 500 word, university level, concise summary of episode 2, written like a university student, so you need to use correct spelling and vocabulary.
3. You need to be clever and creative about it. Use the internet to find transcripts that you can feed into the bot. You need to know the content, to know if it's any good.
4. Universities detect the use of ChatGPT, but students are even smarter. They take the ChatGPT generated material and put it through and rewrite website to avoid plagiarism.

Professor solution:

He asked us to reference the use of the bot/bots as usual. He also asked us to come forward with skills that made the more successful presentations.

Summary 21st-century leaders and learners

21st-century learners, teachers, and leaders are people who employ skills such as critical thinking, collaboration, creativity **to be**
problem-finders and solution-seekers
who are **self-directed** as they look for opportunities
to **solve problems** and create **value for everyone!**

21st century teaching and learning

21st-century **learners**

require

21st-century **teachers**

using

21st-century **approaches**

(e.g. integrated projects)

Who are self-directed as they identify and solve problems and create value for everyone.

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How can we grow these 21st-century skills through integrated projects?

What is an integrated project?

Would you rather eat these ingredients separately?

OR…

What is an integrated project?

Would you prefer to eat the cake cooked and with all the ingredients combined?

Journal for Postgrad Medicine 1994;40:231

Advantages of Integration:

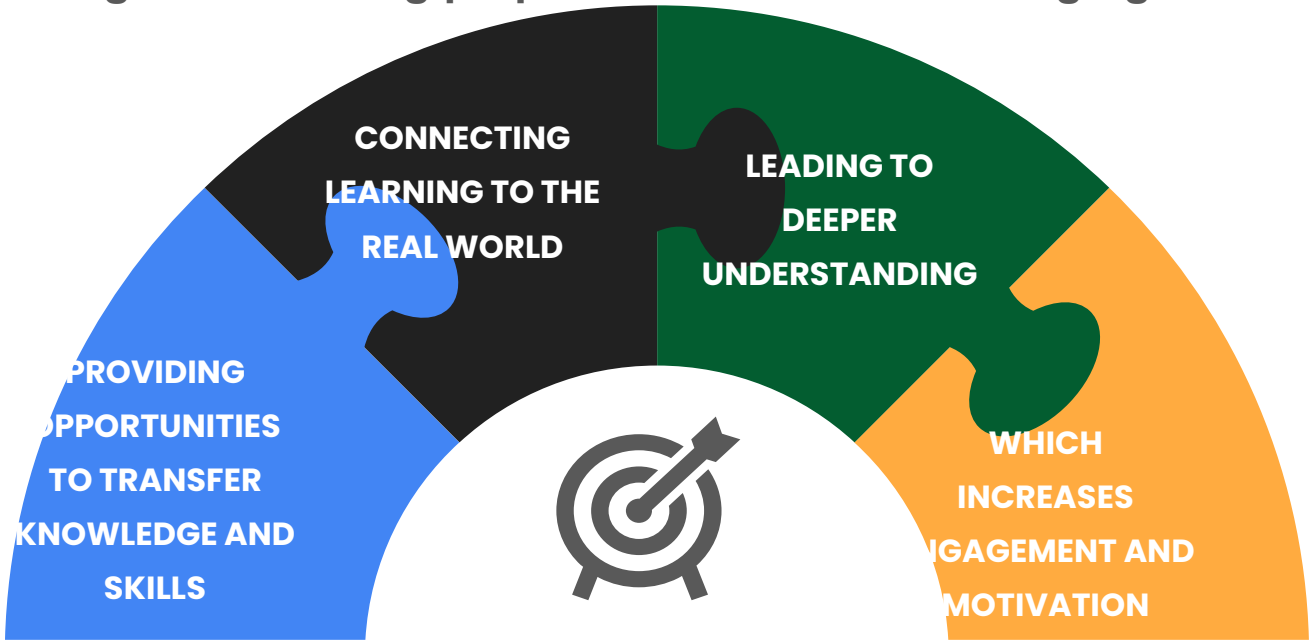
- Reduces fragmentation of topics
- Prevents repetition/wasted time
- Students learn to apply their knowledge to real examples
- Promotes collaboration in teachers/departments
- Could rationalise teaching resources

MOST IMPORTANTLY:

Overcomes the separation in the student's mind between form and function.

Why an integrated project?

Integrated learning prepares learners for a changing world by…



Preparing learners with skills to succeed in a changing world.

The science of learning tells us that learners learn better when they:

- activate their **prior knowledge**
- are paying **attention** and **actively engaged**, because they are **thinking deeply** about the learning
- engaged in the content because it is **relevant** (context) and **authentic**

The integrated project aligns to all these findings.

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START AT END: THANK YOU!

Subject	Updates/changes	Team
Mathematics	Possibly adding Pythagorean theorem from Term 2 to include T1-3 revision	Ms Mtumtum (comm) Me Hester Steyn, Mr Steenkamp, Mr R. Kruger,
Natural Sciences	Addition of 3 scenarios	Mrs Suanne Rampou
Technology	Calculations on given figures, preferred building with found materials	Mr Christo Jones (comm) Mr Estiaan Taljaard Mr Jonathan Freese (guide)
LO	Divide final exhibit into one career and one business idea	Dr. J. Zitha (comm) Mr Ismail Teladia, Ms Mpho Ngwako
SS	Change the research question	Ms Thandy Ndashe (comm) Mr C. Riedewaan

MORE THANK YOUs!

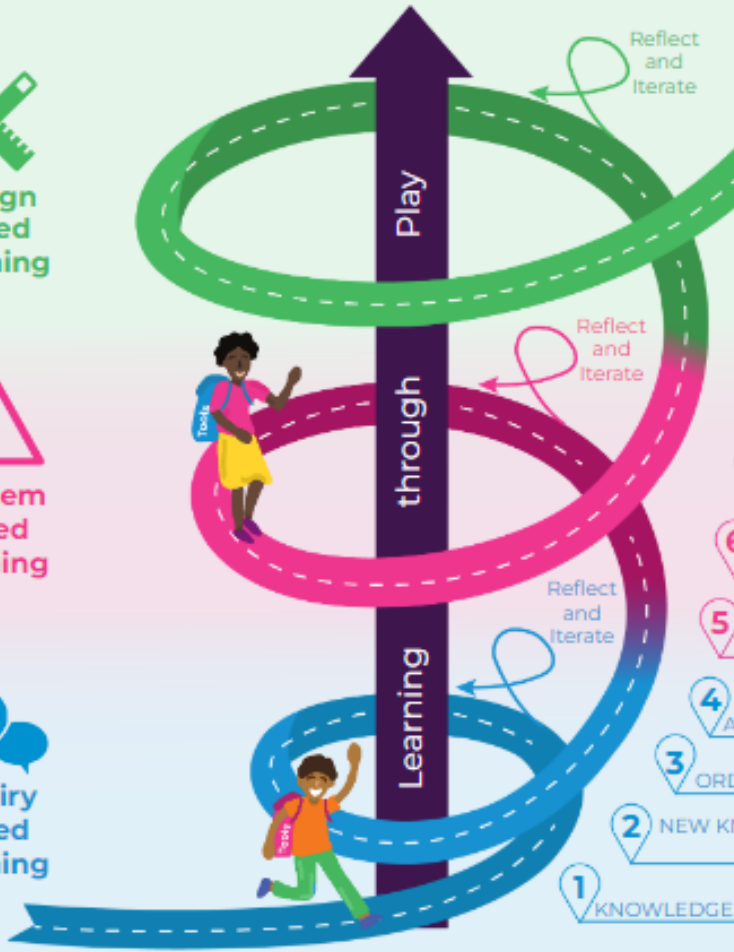
Subject	Updates/changes	Team
EMS	Small changes on rubric (explanations) and edits	Mrs Antoinette Venter Mrs Sharon Tuynsma
Languages	Changes to rubric weight HL translations in LWB	Mr. C Blignaut (comm)
Creative Arts	Add action to project at start, then refer to the Arts Guide	Ms Anina Lundie (Arts Guide)

Our Playful Project-based Learning Process

Design Based Learning

Problem Based Learning

Inquiry Based Learning



Solution -seeking mindset

13 PRESENT — *Hold a public exhibition and present to the public*

12 INTEGRATE — *The **MADD** Space – present your work using **M**usic, **A**rt, **D**rama, **D**ance*

11 FEEDBACK — *Speak to experts or the community to get REAL feedback*

10 PROTOTYPE — *Make your own prototype of your best solution*

9 EVALUATE — *Evaluate and select your best solutions*

8 PRESENT — *Present the point of view and options to an audience*

7 BRAINSTORM — *Brainstorm as many solutions to your problem as you can*

6 EXPLORE — *Consider the different points of view to understand more*

5 DEFINE — *Ask lots of questions to help you define your problem*

4 APPLY — *Apply your knowledge to your environment*

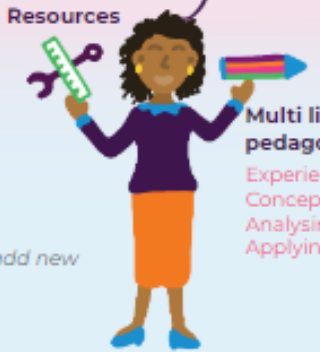
3 ORDER — *Order and categorise your existing knowledge*

2 NEW KNOWLEDGE — *Building on what you already know and add new knowledge*

1 KNOWLEDGE — *Think about what you already know*

The teacher facilitates this learning process using tools and resources and learning through play

Tools and Resources



Multi literacy pedagogy

Experiencing
Conceptualising
Analysing
Applying

How does the integrated project work?

Performances - the processes that learners actively 'DO' during the project

We explore the world (Inquiry learning) by using:

Open ended questions for learners to explore and **discover** the content.

Moving from the **known** to the **unknown**

Comparing, **organising** and **analysing** discoveries

We embrace the challenges by: (Problem learning)

Defining the problem, working together in a team to **find solutions**, strategise

Solving real-world problems collectively

We design the future by: (Design learning)

Creating products and services than can be used to

Solve problems

(in activism, advocating for change e.g. learning about climate change etc.)

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Key elements of an integrated project

DRIVING QUESTIONS

REAL WORLD CONNECTION

FEEDBACK AND REFLECTION

LEARNER VOICE AND CHOICE

MULTIPLE DRAFTS (iteration)

PROCESS NOT PRODUCT

PUBLIC PRESENTATION

PLUS
ATP
PLUS
Programmes of Assessment

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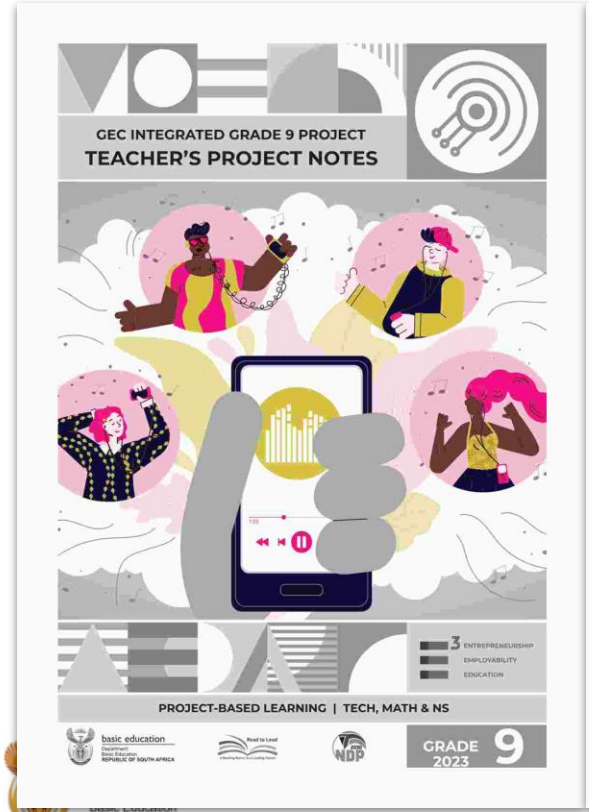
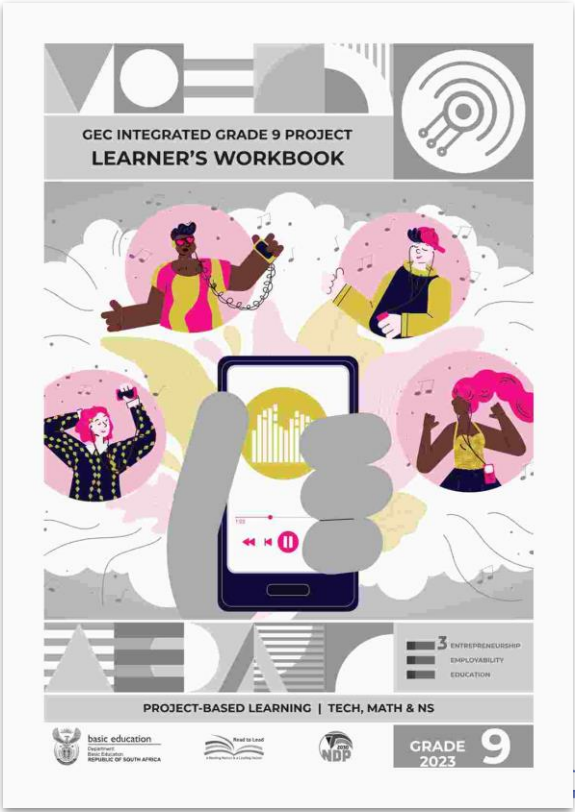
MST Integrated Project 2023





Project Summary

Project summary

Revise your knowledge on electrical circuits, learn more about resistance in circuits and use this new knowledge to research, design and build a simple device that solves the problem for one of these three scenarios:

1. A bunch of friends get together at your house after the exams. You decide to have a dance party tonight, but no-one has any audio equipment. Since you are all curious young minds, you decide to build an audio amplifier with your knowledge of Math, Science and Technology. The DJ connects his phone and gets the party started.
2. Amy works in a small clothing shop and she loves to read. She often gets so engrossed in her book that she doesn't notice when clients enter the store. Help Amy to build a small door alarm that sounds a buzzer when clients enter.
3. Khotso sometimes looks after his sick grandmother in the afternoons. When he plays soccer with his friends outside the house, he cannot hear when she calls for him. Please help him to create a calling bell so he can hear his grandmother calling him when she needs him.

Present your solution to an audience. Explain your outputs using graphs and calculated values.

Inputting 21st-century skills

OBSERVING 21ST CENTURY SKILLS DURING THE IMPLEMENTATION OF GEC-INTEGRATED PROJECTS

As a teacher you already know that you play an **essential role as a facilitator of learning**. You know that rather than simply giving knowledge to learners, you create an environment in which your learners can **explore, discover**, and **construct** their own understanding of the subject matter. As a facilitator you

- create an **emotionally and psychologically safe learning environment** so that learners feel safe to participate in the lesson,
- provide **prompts** when learners get stuck,
- provide **constructive and timely feedback** to learners,
- and make adjustments to your lesson based on what you observe (this is assessment as learning) so that learners can grow their understanding and grow their skills and competencies.

While learners are working on this project, your role as a facilitator is to **observe, listen, and record the process of their learning (21st century skills)** during the project. If you're new to formally observing these skills, we have provided guidance for each task by suggesting particular 21st century skills you might focus on. You will find these suggestions in the boxes entitled *'21st century skills to look out for.'* These suggestions are not exclusive; they're intended to simplify your observation process so you do not need to try and observe everything all at once. Once the process becomes more familiar to you, you can begin to explore ways to observe additional or different skills. To find out more about the 21st Century Skills please read the 'Teachers guide to 21st Century Skills" as well as the GEC Manual, under the section 21st century skills.

What is new? Adding observation opportunities

PART 1 EXPLORING THE WORLD
(INQUIRY-BASED LEARNING)

Please note: This project covers 100% of the Technology third term task mark (70 marks), 50% of Mathematics third term task marks (50 marks) and 50% of the Natural Sciences third term task marks (30 marks).

STEP 1: Prior knowledge

Think about what you already know

Purpose of this step: The learner reflects on and shares his/her own knowledge, experiences and perspectives (stimulating prior knowledge and evaluating baseline knowledge).

21st century skills to look out for

In this step, learners are reflecting on and sharing his/her own knowledge, experiences, and perspectives. In this step, you may have the opportunity to observe elements of **Metacognition.** Metacognition is about being aware of how we think, what we know, and how we know it. Metacognition helps us to reflect on our thinking, set goals, and monitor and evaluate our learning. Some of the Sub-skills that make up Metacognition include ***5.1 Setting goals and planning:*** Did the learner set goals and make a plan during the project? ***5.2 Monitoring progress against plans:*** Did the learner monitor their progress against their plans? ***5.3 Reflecting on planned work:*** Did the learner reflect on their project and or their prior knowledge?

1.1 (+NS +TECH) Learners start with Circle Map on ***Worksheet 1***: They write what they know and can remember about electricity in general in the outer square. In the bigger circle they write what they know and remember about electrical circuits. This is just a brain dump and it doesn't have to be organised.

STEP 2: New knowledge

Build on what you already know and add new knowledge

Purpose of this step: Learner observes or takes part in something new that is an extension / expansion of prior knowledge.

21st Century skills development

In this step, learners observe or take part in something new that is an extension/expansion of their prior knowledge. In this step, you may have the opportunity to observe elements of **Critical Thinking**. Critical thinkers ask questions, find the right information, and apply it to solve a problem. Some of the sub-skills that make up critical thinking include ***1.1 Asking questions:*** did the learner ask appropriate questions to find out more information? ***1.2 Evaluating ideas/information***: was the learner able to identify what information was useful to solve the problem? ***1.3 Identifying patterns***: did the learner use tools (e.g. mind maps and diagrams) to help them to organise information?

Infusion of the 21st-Century Skills - new for 2023.

3 ENTREPRENEURSHIP EMPLOYABILITY EDUCATION

MST Project changes:

- Three scenarios added
  - Knock-on effect due to above
  - Rubrics adapted to above
- Dummy variables added
  - To ensure equality
- Permission to build from found materials
  - Looked at the snap kit as resource
  - One working model per class/school
- Adding Pythagoras (special request)
  - Pythagoras is only in Term 4. Area, Surface Area as well as perimeter are also only in term 4. Is that a problem?
  - Classifying triangles, as well as constructions are done in term 3.

MST Resource pack

instructables

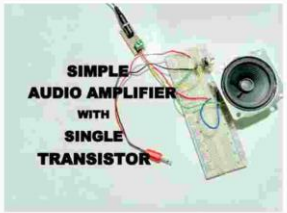
Simple Audio Amplifier Using Single Transistor

by JunezRiyaz

Audio Amplifier is a device which strengthen the weak signal. Usually in audio systems we use amplifiers to drive the speakers of high power rating .

Now , in this Instructables you are going to see how to make an audio amplifier using single transistor to drive the speaker of 10W .

For more information checkout my website Electronics Projects Hub



Step 1: Components Required

Transistor – 2N6292 x1 [Aliexpress]

Resistor – 2.2k x1 [Banggood]

Capacitor – 22uF x1 [Banggood]

3.5mm Jack x1 [Banggood]

Speaker x1 [Banggood]

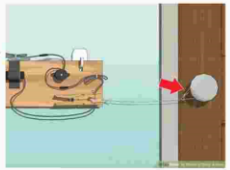
Breadboard x1 [Banggood]

Simple Audio Amplifier Using Single Transistor: Page 1

Step 4

Fasten the other end of the string to your door. Attach the string to the doorknob or tape it to a part of the door. Adjust the length of the string so that when the door opens, the string is pulled. When the cardboard pulls out, the alarm will go off.

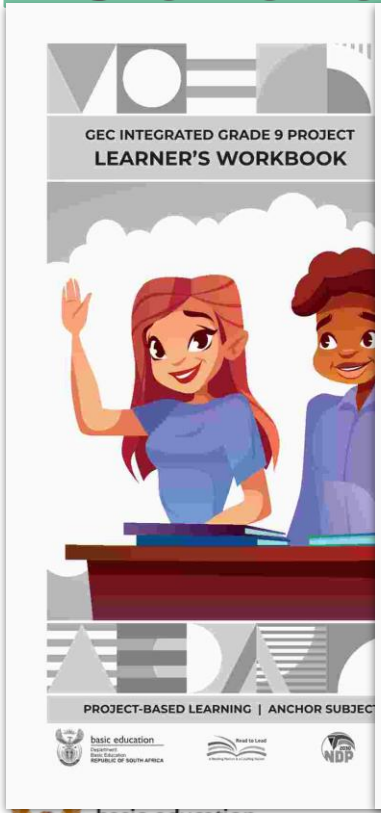
If your door is painted or made of a nice material, you may not want to tape the string to it. Some tape, when peeled away, can damage paint or wood.

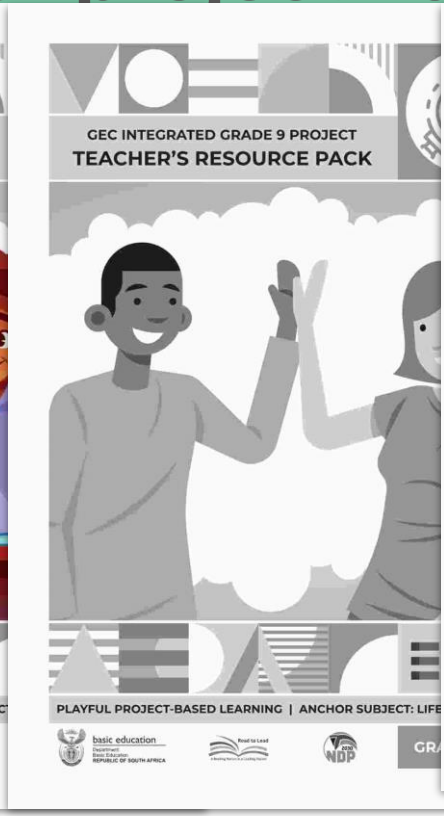


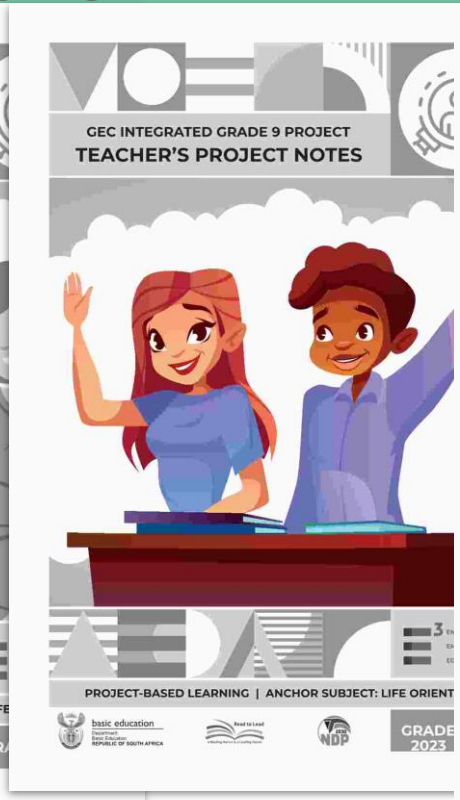
How to Make a Simple Electric Bell at Home | School Science Project Working Model Ideas

https://www.youtube.com/watch?v=NZGfJun4yTg

LO anchor project 2023







INTEGRATED PROJECT 1:

Life Orientation (Anchor Subject)

Economic Management Sciences

Social Sciences

Languages

Creative Arts

LO anchor project

Life Orientation project summary

Phase A and C: Learners research a career opportunity and a business idea that aligns with their personal strengths, capabilities and interests. They write a report on their findings and present this report to an audience. Learners reflect on how their research on apartheid laws has influenced their decisions. They make props, posters, create dances and songs, or any other item (Creative Arts) to support their public presentations.

During Phase B learners work in groups to identify a simple problem in the community where they can assist. They work collaboratively towards a solution, apply to sponsors for resources and they implement their solution in their community.

LO anchor project

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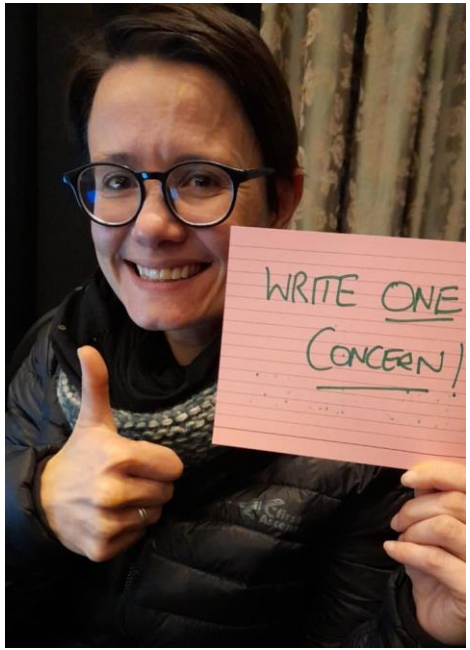
LO anchor project changes

LO	BOTH career and business researched and presented, rubrics adapted accordingly, many fixes on rubric simplify marking
EMS	Fix mistakes on rubric and worksheets
SS	Research questions changed, added worksheet with cause and effect map, specific changes to rubrics and other worksheets
HL	Rubric weighting changes from 25/25 to 20/30 Translation of Workbook pages for learners 11 languages
FAL	Fix worksheet
ARTS	Added to start of project to action the guide from week 1

Harvesting Challenges for Implementation

Please write your biggest concern down on the cards on your table.

We will analyse these all the concerns and use these in the World Cafe tomorrow.



Thank you.