General message for Science Teachers
From Godwin (G2) Nhauro: NECT - Assistant National Education Programme Manager

Good day colleagues
These are uncertain times for all of us. The sands are shifting daily and many of us are feeling anxious about what happens next to our health and safety, livelihood, to our education, to our freedoms and to life as we knew it.
Whilst we practice physical distance and social solidarity, this disruption also provides us with an opportunity to reimagine how we live and how we work. It also allows us to exercise control over the aspects that we can change and, in this instance, how we can start working on curriculum catch up plans.

Teaching Science for Understanding: Part 7 Science messaging	**WEEK 7** Accessing Teaching & Learning Resources
Good day scientist groomers: From Godwin (G2) Nhauro – ANEPM (NECT)	
Good day colleagues, please note that the DBE has put a LOT of online resources on its website for you utilise - https://www.education.gov.za/. These are some of the resources you can access through the given DBE website. To make your life easier, I took the liberty to give you the direct link to Science and Technology materials: 1. MST workbooks: For Grade 7 – 9 Natural sciences and Technology workbooks: http://www.mstworkbooks.co.za/index.html. As most of you are already familiar with the MST workbooks, they are easy to follow, CAPS aligned and have a several assessment exercises per concept/topic that you can give to learners. 2. Grade 4 – 12 Siyavula Science textbooks: https://www.siyavula.com/. If you are on the MTN or Vodacom network in South Africa, accessing these textbooks will not cost you any data. 3. Grade 4 – 6 Thunderbolt science materials: http://www.thunderboltkids.co.za/ 4. Grade 4 -9 Natural sciences and Technology Recovery plans: https://www.education.gov.za/Home/RecoveryPlan2020.aspx "You can't teach people everything they need to know. The best you can do is position them where they can find what they need to know when they need to know it." Seymour Papert Be safe and observe social distancing.	

Teaching Science for Understanding: Part 6 Science messaging	**WEEK 6** How to teach experiments using videos and simulations for meaningful learning.
Good day scientist groomers: From Godwin (G2) Nhauro – ANEPM (NECT)	
Welcome colleagues to Part six of Teaching Science for Understanding series. Today we are mainly focusing on how to teach experiments using videos and simulations for meaningful learning. Without overstating we know most of our schools are not privileged with laboratories or lab equipment. Nevertheless, that does not mean we cannot fulfil the outcomes of the curriculum policy. In the previous series we have discussed several ways of engaging learning for effective learning inter alia, use of videos and simulations in teaching experiments. How do we align the teaching of experiments using videos, while making sure the learners are acquiring the associated scientific process skills as outlined in CAPS (observing, measurement, predicting, interpreting, etc.)? Solution: Make your lesson as interactive as possible, put learners into groups and follow the steps below.	

What needs to be done prior to the experiment:

- **Purpose/Question:** Clarify to the learners what exactly is the aim of the experiment, what they need to learn from it?
- **Research/Prior reading:** Ask learners to go and find out as much information as they can on the experiment to be done.
- **Hypothesis:** After doing the research, let learners try to predict the answer to the problem, i.e. make an 'educated guess' based on the reading/research done.

During the experiment-based video: Play and pause approach to allow interactive learning

- **Observation:** Play first part of the video and pause. Let learners record their observations in their groups.
- **Prediction:** Using their observations, let learner make informed prediction on the results in their groups and give feedback to the class--- class discussion: prompt learner's critical thinking by asking *thought provoking questions*. Allow learners to ask questions as well.

Play video to show results:

- **Record:** Let learners record results from the video
- **Review and Reflection:** In their groups, let learners review and reflect on their predictions against the provided results or experiment outcomes.
- **Analysis and Conclusion:** Allow learners to analyse the results and draw their own conclusion and check to see if your hypothesis was correct, allow for discussion and feedback.
- **Wrap up** the session by aligning the intended outcomes of the experiment to the existing established scientific facts on that particular concept.

See examples on this link: https://www.youtube.com/channel/UC0C1rkUCy1zBCFPU25kWUTw

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Teaching Science for Understanding: Part 5 Science messaging	**WEEK 5** How to teach Technology
Good day scientist groomers: From Godwin (G2) Nhauro – ANEPM (NECT)	

Technology is a practical based subject meant to produce engineers, technicians and artisans needed in modern society and the need to develop a technologically literate population for the modern world.

As the teacher your main role in this subject is to cultivate innovation, creativity and critical thinking skills in learners, towards developing practical solutions to problems, taking social and environmental factors into consideration. Being a practical based subject (70% Mini- Pat and 30% test/exam) more time should be spent on learning through practical based activities.

How to assess: Across the InterSen phases learners are assessed based on same skills: level of design process skills: investigation skills, design skills, making skills, evaluation skills and communication skills for each group. The expectation is that learners gradually gets better in each skill with practise. In short, the subject is designed to give learners opportunities to develop and apply specific design skills to solve technological problems—and as a teacher it is your job is making sure that these objectives are met.

Further resources visit: https://nect.org.za/materials/natural-sciences-technology

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Teaching Science for Understanding: Part 4 Science messaging (145 words)	**WEEK 4: 17 April 2020** Strand: Planet earth and beyond
Good day scientist groomers: From Godwin (G2) Nhauro – ANEPM (NECT)	
This marks part 4 of Teaching Science for Understanding (TSU) series. With planet Earth and beyond strand, one of the best teaching approaches that will enhance learner understanding is the project approach. Learners should build models of solar system being guided by a rubric – let learners use homemade materials (Styrofoam balls or tennis balls, cardboard pieces, glue, sticks, ball stick, beads etc.). Make use of a rubric for assessment. Each member of the group should be given a chance to talk during feedback and answer questions. You can access all teaching resources: tracker and planners, lesson plans, content videos and posters for this strand free on NECT website: http://nect.org.za/materials/natural-sciences-technology You can teach a student a lesson for a day, but if you can teach him to learn by creating curiosity, he will continue the learning process as long as he lives. - Clay P. Bedford Stay home, stay safe, Observe social distancing.	

Teaching Science for Understanding: Part 3 Science messaging (141 words)	**WEEK 3: 10 April 2020** Strand: Energy and Change
Good day scientist groomers: From Godwin (G2) Nhauro – ANEPM (NECT)	
In our last 2 messages on Teaching science for understanding series we touched on the use of Visual aids, animations, simulations, models as teaching methodologies of promoting interactive learning as well as increasing and improving learner information retention on concepts. This week let's look at how we can teach energy and change for understanding. In addition to employing the above-mentioned approaches to teach this strand, this concept can be easily taught through a series of fun mini-games and play.	

You can use this to determine what your learners already know and to challenge their own thinking, thereby extending their understanding. This approach will deliver improved learner engagement and academic performance in your classroom.

"Tell me, I forget, show me, I remember, involve me, I understand." Carl Orff

For some examples of mini games check: https://www.legendsoflearning.com/learning-objectives/conservation-of-energy/

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Teaching Science for Understanding: Part 2 Science messaging (195 words)	**WEEK 2: 3 April 2020** Strand: Matter and Materials
Good day scientist groomers: From Godwin (G2) Nhauro - ANEPM (NECT)	

Matter and materials is one of the areas in which concepts often cannot be learned effectively, and where misconceptions are encountered at the highest rate in NS/Tech.
Misconceptions can be largely attributed to the abstract/theoretical teaching approach to experimental based concepts due to lack of lab facilities and equipment in most of our schools.

Solution: animation, videos, simulations and models (ball-and-stick) are powerful tools that you can use to transform abstract concepts into interactive visual content, making it easier for learners to understand the concepts and yielding almost the same results as performing the real experiments.

This forms part of inquiry-based learning where learners are provided with opportunities to understand concepts through active learning, make observations, ask questions, test out ideas, think creatively, use their intuition, attain specific science process skills and communicate scientific explanations and arguments.
If learners create models it can make their thinking visible, allowing rapid feedback from teacher to learner and learner to teacher, thereby allowing you as a teacher to make meaningful learning a reality.

For free science animations and simulations check: https://phet.colorado.edu/
Always remember this approach must be accompanied by pre-and post-explanations and discussion to address misinterpretations and misconceptions.
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Teaching Science for Understanding: Part 1 Science messaging (133 words)	**WEEK 1: 27 MARCH 2020** Strand: Life and Living
Good day scientist groomers: message from Godwin (G2) Nhauro - ANEPM (NECT)	

Did you know that more than 90% of the life and living concepts can be taught through visual aids?

Visual aids supplements text/words with a picture, chart, or illustration, thus facilitating a more interactive environment with the learners.

Most learners learn better through *visuals* and *interaction* than through listening. So, a good visual aid can really help your learners actively participate, understand and remember what you taught.

Study shows learners who only heard a teacher retains about 10% of the information; heard and saw visual representation about 65%; heard, saw and interact about 90%. That's a lot more!

Colleagues let's keep our lessons more interactive and interesting.

"Tell me, I forget, show me, I remember, involve me, I understand." Carl Orff

For free charts and posters: https://za.pinterest.com/pin/359373245246941333/

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