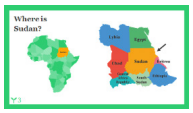
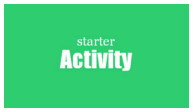
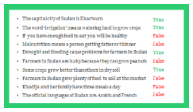
REGREEN THE DESERT

PowerPoint notes

1.		Introduce the challenge. Explain that pupils will be using their STEM skills to try and solve a problem faced by communities in a country in a very different part of the world.
2.		The country they are going to be focusing on is Sudan. Ask pupils if they already know anything about Sudan then show the slide. • Sudan is the world's largest producer of gum arabic. This is a natural resin which comes from the acacia trees. The gum can be used as a glue on stamps or in inks and paints. But it is most valued for its use in foods such as sweets and fizzy drinks. • Football and athletics are the most popular sports. • The official language of Sudan is Arabic... but there are over 400 languages and dialects spoken. • Most popular tourist attraction is the Pyramids of Meroe, build 500BC. Very different shape to pyramids in neighbouring Egypt. • Sudan is a country that suffers from conflict. • Sudan split into two countries in 2011, Sudan and South Sudan after the south voted for independence. • Much of Sudan has been badly affected by climate change... in particular deforestation and drought.
3.		Before showing the first map ask students if they can point out Sudan on a globe or a world map that you have in your classroom. Before showing the second map ask them if they can name any countries that border Sudan.
4.		This introduces the personal story that the challenge is based on. Check pupils understanding of deforestation. Maybe ask them how they think deforestation, drought and /or flooding could destroy homes and make growing crops difficult.
5.		
6.		Hand out the pupil activity sheet *Khadija's story* and allow time for pupils to read then discuss what they have learnt about Sudan and Khadija's life. Did anything surprise them? Hand out the True or False cards to find out what they have remembered. Answers are on the next slide.
7.		1. True 2. True 3. False - As well as enough food you need a variety of different food including plenty of fruit and vegetables to be healthy. 4. False - malnutrition is when people do not have enough food to eat or a wide enough variety of food to keep them healthy. 5. True - both drought and flooding are caused by climate change 6. False - farmers grow peanuts because they can grow in dry soil. Farmers would like to have more water to grow a wider variety of crops such as fruit and vegetables. 7. True - sorghum, sesame and peanuts can all be grown in drier areas. 8. False - farmers want to be able to sell food at the market but often can not even grow enough for their own families. 9. False - they have just one. 10. False - Arabic and English are the official languages of Sudan.

8.		
9.		Introduce the Sustainable Development Goals (SDGs) also known as the Global Goals . Do this by explaining that in 2015 the United Nations identified 17 key goals that need to be achieve to solve world poverty by 2030. You may like to show this video by Emma Watson youtu.be/-cEUhHTlcDU
10.		This is the full set of Sustainable Development Goals . You may wish to print out for display. Hand out the *Sustainable Development Goals sheet* and ask pupils to tick any they think relate to problems Khadija and her children face e.g. **Global Goal 1** - Farmers like Khadija's who cannot grow enough food to eat or to sell to buy other life essentials are living in. **Global Goal 2** - Families like Khadi and her community who are only able to have one meal a day are often hungry. **Global Goal 3** - Not having enough food to eat makes it difficult to be healthy (Global Goal 3). **Global Goal 4** - Often girls have to walk up to four hours a day collecting water, reducing the amount of time they can spend at school. **Global Goal 8** - With Khadija spending so much time collecting water, she has little time to spend on doing work that could earn an income. There are lots in interconnections. To explore further you could do the Global Goals string activity and who's responsible - practicalaction.org/global-goals
11.		Hand out the *Under pressure* pupil activity sheets and materials.
12.		Go through the *Under pressure* worksheet with pupils. You could ask GCSE students to calculate the pressure at each hole in Pascals. This extension activity is explained in the Teacher's guide.
13.		Introduce the challenge. Explain that STEM skills can be used to solve some of the world' toughest challenges, and help us achieve the SDGs. They will be looking at just one way that using their STEM skills could help Khadija and her family.
14.		The challenge is focusing on one of the solutions that can help farmers like Khadija, i.e. irrigating crops. Pupils are asked to design a model of a system to collect rainwater and dispense it to water crops. Pupils should use the knowledge they gained by carrying out the activities on the *Under pressure* worksheet, and also think about how rainwater could be captured. You may like to set a homework task or extension activity for older pupils to research more about irrigation systems.

15.		
16.		We suggest that pupils present their model to the rest of the class reflecting on how well they worked together, problems they solved etc. (this will be necessary if you are planning for your pupils to gain a CREST award). Allow time for pupils to work on their presentations as well as building their model.
17.		Pupils may be interested to know that a project led by Practical Action will begin to work with Khadija and her village starting in 2020. The project is called 'Turning the Tables on Climate Change' More information about this is available on Practical Action's website practicalaction.org/turn-the-table
18.		A reminder of the solutions included in the *Khadja's story* to highlight that irrigation is just one of a suite of many solutions that work together.
19.		Similar solutions have been used all over the world, including • Zimbabwe (picture shows a solar powered irrigation pump). • Bangladesh (picture shows growing pumpkins in infertile land along the riverbank). • Nepal (picture shows irrigation systems high in the mountains).
20.		
21.		CREST Taking part in the Regreen the desert is a great way for pupils to gain a CREST Award. The challenge is aligned to the Discovery Award, but can be used to gain a Superstar award or as the starting point for a Bronze, Silver or Gold Award. More details in the teacher's notes. crest.org Big Bang Fair and competition Pupils who have taken part in a STEM challenge can enter their work into the Big Bang competition. This is a great way of pupils showcasing their work to other pupils and adults at a regional Big Bang events. If they become finalists they will be invited to attend the National Big Bang Fair which takes place in March each year. Both of these are amazing, inspiring experiences for young people. competition.thebigbangfair.co.uk
22.		Two great opportunities to join in national initiatives. 1. British Science Week from the British Science Association. Grants are available britishscienceweek.org 2. The Great Science Share for schools had lots of support materials on their main website greatscienceshare.org N.B. Grants are available for British Science Week britishscienceweek.org/about-us/grants/