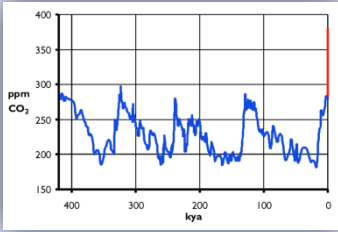


Science in the news



Scary CO₂ milestone reached

Why are people worried about rising CO₂ levels?



snapshotscience.co.uk/go/34



Scientists 3-D print a bionic ear

What do we mean by a 'bionic' body part?



snapshotscience.co.uk/go/35



Mercury exposure linked to dramatic decline in Arctic foxes

This is an example of bioaccumulation – what does this mean?



snapshotscience.co.uk/go/36



Malaria hope: Bacteria that make mosquitoes resistant

How could this technique stop the spread of malaria in humans?



snapshotscience.co.uk/go/37



Crowds watch 'gorgeous' solar eclipse in Australia

Why was this eclipse only visible from one small part of the Earth?



snapshotscience.co.uk/go/38

SPIDER-GOAT, SPIDER-GOAT...



Credit: the gradigal untitled 3 @ Flickr

...does whatever a spider-goat does.

Can she swing

from a web?

No she can't

she's a goat...

...however, she can produce spider silk proteins in her milk.

THE STORY

You may have watched the Horizon programme *Playing God* on BBC2 on Tuesday, and if you didn't there is still time to catch it on iPlayer. If you are teaching about genetic engineering it is well worth spending time watching it as it covers some amazing uses of this branch of biotechnology.

Despite the range of 'synthetic biology' examples out there, in this post I have decided just to concentrate on the spider-goats, the transgenic poster girls of the moment.

Spider silk is incredibly lightweight yet strong. It is five times stronger than steel of the same diameter. It is also biodegradable and compatible with the human body. This amazing material has a myriad of applications in industries as diverse as space flight, fashion and neurosurgery.

There is no wonder that biotechnology companies have been scrambling to find a successful way of mass producing it over the past few years. Attempts have included farming spiders (fail - they tend to eat each other), and the genetic modification of different organisms such as tobacco plants, before Nexia Biotechnologies was successful with the modification of goats that expressed the silk proteins in their milk. The spider-goat was born.

TEACHING IDEAS

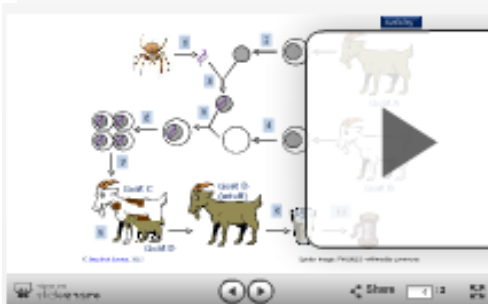
A novel material

Silk is a natural polymer so you could use this as an example when teaching about materials in GCSE chemistry. Can the students match up it uses to its properties? For example, it could be used instead of nylon in fishing lines because it is strong but biodegradable and therefore better for the environment.

As I have already covered, silk has properties that often mean it is a better choice of material than its more traditional rivals. Students can research into the advantages and disadvantages of silk compared to another material for a range of applications.

Genetic engineering

The actual process by which the goats were created is an example of genetic modification. This resource can be used to teach the method and can be used with KS3 students when studying recombinant DNA or as a way of extending the more able at GCSE.



download

Students are given slide 2 printed out as cards. They have to use the diagram on slide 1 to put the statements in the correct order to show the method used. Slide 2 contains some extension questions.

Ethical questions

Of course, there is scope for an ethical debate on this and other examples of transgenic animals. Are the scientists 'playing God' (as the title of the Horizon programme mentioned suggests) and what opinions do your students have about the ethics surrounding the spider-goats?

WEBLINKS

Video clip of the Horizon programme showing the spider-goats.

Topical stories and events to use in KS2-5 science lessons.

Show students how science relates to real-life.

Teaching ideas on how to use each story in lessons.

Free, downloadable resources.

Weblinks to useful news stories, videos and other resources.