ambic STEM CHALLENGE

Trust Red

NEWCASTLE UNITED FOUNDATION

SERIÖS GROUP NEWCASTLE EAGLES BASKETBALL

NISSAN

Spitfire

IMH DRIVING HYDRAULIC SOLUTIONS

FORD A SPIROL Company

RESPONSIVE ENGINEERING

SOLIDSOLUTIONS

THE PFC TRUST

Plastic Furniture Company

RESOURCE PACK

Lesson Plan

Learning objective and success criteria:	Before the lesson:
◆ To design a piece of furniture to solve a problem. ◆ Success Criteria ◆ I can identify a need or problem within the school. ◆ I can design an innovative, functional and appealing product. ◆ I can analyse and evaluate against a design criteria.	Watch the Ambic Stem Challenge video. Think about problems to help guide children if they are struggling.

Learning objective and success criteria:	Before the lesson:
Innovative Practical Ergonomic Engineer Ingenuity	Ambic's competition video Powerpoint Pencils, pens, markers Paper, card, resource sheets Competition entry form

Attention Grabber:

Share Ambic's competition video – this may already have been shown in an assembly but it might be a good idea to give the children a recap.
Slide 4: Explain that every day people are designing new products to solve a problem or dilemma they have noticed or found.
Slide 5: Share who Ambic are and what we do. Ambic is a company that manufactures different types of furniture for schools, as well as universities, restaurants, laboratories and residential properties. Teachers may want to discuss what some of these industries are. Many headteachers and teachers come to us needing help for a problem they have noticed in their school. Ambic measure, design, draw, programme, machine, paint, assemble and quality check everything that leaves the factory as this is all part of our engineering journey.
Slide 6: Explain that all day every day the people who work at Ambic use science, technology, engineering and maths to complete their jobs. Did anyone notice what those 4 words spell?
Slide 7: Show the children some of the different jobs Ambic's employees do, you might want to ask the children if their parents, carers or anyone they know does any of these jobs.

Main Event:

Slide 8: Remind the children of the Stem Challenge video, explain that the children are now going to be engineers so we need to know some engineering vocabulary. You might want to record this in a CCD (cognitive content dictionary) grid either as a class or individually, see resources attached, to remind the children throughout the competition.
Slide 9: Discuss the 5 key words, have the children heard the word before? Do the children know the definition? Can they use it in a sentence?
Slide 10 &11: Share the information about the competition with the children, have a look at previous entries, what do you think of them? Show the children some of the projects and products Ambic have made in the past.
Slide 12: Have a look around the classroom or you might even want to have a look around the school. Can the children point out anything that they would change, improve or even need for the area? You may want the children to take part in some 'Consumer research' where they ask other members of staff and children their opinion (only if time allows).
Slide 13: Remind the children this isn't about making the craziest, wildest product they can think of, bring the children back to the key vocabulary. Remind children about shape, space and measure. Think carefully about how it is going to be made and what it will look like. Where is it going to go? Who is going to use it? It might be linked to the school mascot or theme, making it more bespoke, something that Ambic does all the time.

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Phone: 0191 389 1888
Email: stemchallenge@ambicmanufacturing.com

The Ideas:

Depending on how your school will be submitting the designs, depends on how you want the children to work.
You may want the children to work in groups to design a product or you might have all the children submitting their own idea and then work as a class to perfect and finalise it.
We are looking for an innovative product that takes into account the environment and user or users.
Your submission must include:

- A brief description of the problem you encounter in your school
- A drawing or sketch of your proposed product with annotations of:
  - Colours, patterns and textures - i.e. wood effect, gloss, metallic
  - Basic materials to be used – i.e. wood, metal, carpet.
  - Size with approximate dimensions
  - The user or users
  - Description of moving parts if any – i.e. open and close, sliding, turn.

There is a very basic example on slide 14

Not required, but you may want to include or do to challenge your pupils:

- Description of the different problems you discussed
- Research of current products on the market.
- An evolution of ideas
- Any photos of examples or prototypes.

Wrapping Up:

Slide 15: Share some of the product designs, these may be from your class or the ideas we have shared. As a group discuss and evaluate the products asking these questions:
Did the product meet its purpose?
What do you like about the product and why?
What do not like about the product and why?
What can you do to improve it next time?

You may want to adapt these questions for the year group you teach.
You may also ask the children to use the 5 key words in their answers.

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My design evaluation

Aim of the project:

What went well:

Challenges I faced:

How I dealt with these challenges:

Next time I would:

My favourite part was:

Word	Heard before	Prediction	Actual Meaning	Use in a sentence
Innovative				
Practical				
Ergonomic				
Engineer				
Ingenuity				

Designer/s: _____

Problem within school: _____

_____

What is this piece of furniture used for?

What do you think it is made from?

How could you describe the colour?

Who might use it? How do you know?

Is it practical?

Would this fit in our school?

What is this piece of furniture used for?

How could you describe the shape?

Do you like it?

Peer evaluation

Think about:

- Does the design solve the problem?
- Is the design innovative?
- Does the design and prototype achieve all the criteria?
- Will it work within our school?

Great design, I like how you…	You might want to think about improving