

Introducing STEM Into The Classroom

IT'S REALLY NOT THAT HARD!!

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- ▶ **WHAT IS STEM?**
- ▶ **S - SCIENCE**
- ▶ **T - TECHNOLOGY**
- ▶ **E - ENGINEERING**
- ▶ **M - MATHEMATICS**

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- ▶ YOU CAN ADD ARTS TO MAKE
- ▶ STEAM!!
- ▶ Each component forms part of the same unit of work or even lesson!

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- ▶ COMPONENT PARTS:
- ▶ SCIENCE - There are two elements to a Science Program
 - ▶ 1. Understanding a particular Science concept.
 - ▶ 2 Science Method

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- ▶ Science method: An experiment is designed to test one variable.
- ▶ All other aspects of the experiment **MUST** remain the same!!

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- ▶ TECHNOLOGY
- ▶ TECHNOLOGY MODEL:
- ▶ DESIGN
- ▶ BUILD
- ▶ TEST
- ▶ OPTIMISE THEN TEST AGAIN

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- ▶ **ENGINEERING:**
- ▶ What is the best way to build your design?
- ▶ What tools and processes do I need?
- ▶ Can I make it more effectively?

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- ▶ **MATHEMATICS:**
- ▶ Mathematics is a key component of just about everything we do. It involves collecting analysing and presenting data.

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▶ WHY STEM?

- ▶ We all learn more effectively by doing. Practical learning take our conceptual understanding and allows us to apply it in a real life situation. This builds and deepens our ideas and concepts and allows us to effectively develop our ideas.

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- ▶ **STEM IN THE PRIMARY SCHOOL**
- ▶ A few words about Piaget!

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- ▶ **Age**
- ▶ **Characteristics**
- ▶ **Goal**
- ▶ Birth to 18-24 months old
- ▶ Motor activity without use of symbols. All things learned are based on experiences, or trial and error.
- ▶ Object permanence
- ▶ 2 to 7 years old
- ▶ Development of language, memory, and imagination. Intelligence is both egocentric and intuitive.
- ▶ Symbolic thought

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Preoperational

2 to 7 years old

Development of language, memory, and imagination. Intelligence is both egocentric and intuitive.

Symbolic thought

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Concrete operational

7 to 11 years old

More logical and methodical manipulation of symbols. Less egocentric, and more aware of the outside world and events.

Operational thought

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Formal operational

Adolescence to
adulthood

Use of symbols to
relate to abstract
concepts. Able to
make hypotheses
and grasp abstract
concepts and
relationships.

Abstract concepts

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- ▶ What can expect from children of this age?
- ▶ Children think and work in concrete terms
- ▶ Explaining concepts should avoid abstract explanations.

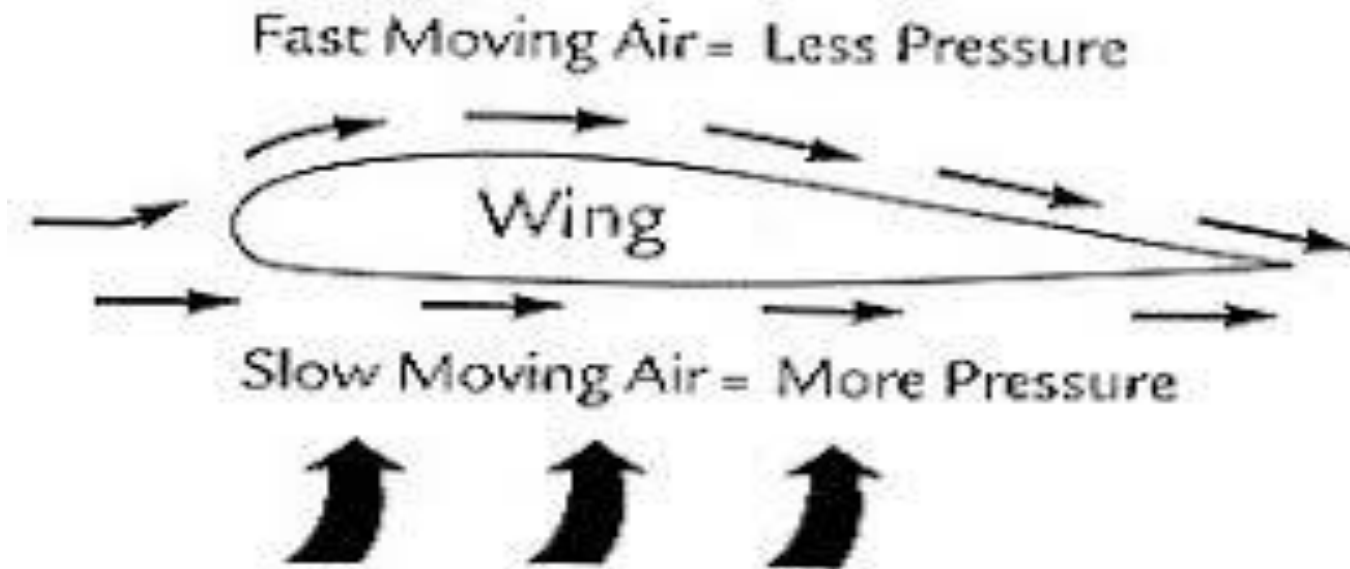
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- ▶ What does a STEM unit/lesson look like?
- ▶ Each component of STEM is represented.
- ▶ Practical focus

Introducing STEM - FLIGHT

- ▶ Science - Bernoulli Principle
- ▶ Technology - Designing and testing a paper aircraft.
- ▶ Building and optimising the aircraft.
- ▶ Measuring, comparing and presenting performance data,

Introducing STEM BERNOULLI PRINCIPLE



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- ▶ Now we know how an aircraft stays up, lets make one and test it.
- ▶ Your task is to design and build a paper aircraft that will fly the furthest.

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- ▶ We test all aircraft and spreadsheet the results!
- ▶ From this we can graph the results.
- ▶ From the graph we can draw conclusions of which designs were more effective.
- ▶ This could lead to a redesign over and over.