INTRODUCTION TO STEM

What is STEM Education?

STEM education is the integration of science, technology, engineering and mathematics in an effort to increase pupils' interest, engagement and awareness in these areas. It also encourages pupils to work together as a team using communication, collaboration and problem-solving skills while persisting with STEM challenges or projects.

Explore how to use *STEM Projects* in your dassroom ...

Allocating Time to STEM Education

Allow a period of time each week for pupils to work on their STEM project. Each project is expected to take between four and six sessions, depending on pupils' abilities, prior knowledge and working pace, as well as the availability of resources. Depending on time allocations, each session should focus on one or two steps in the design process.

Alternatively, teachers may focus only on the creating stage of the design process by preparing resources prior to the lesson. This will allow most projects to be completed in one session.

Note: More time should be allocated (if needed) to encourage pupils to persist with challenges and make corrections to their designs. However, be mindful not to let projects drag on, as pupils may lose interest in future STEM projects.

Suggested Teaching Sequence

Session 1—find out information and plan

- Session 2—organise materials and start to create
- Session 3—complete creation, evaluate and refine

Session 4—communicate

Outside of Class Time

Pupils may ask to work on their project outside of class time. This should be encouraged to maintain pupils' interest.

PLANNING, TEACHING AND ASSESSING

Planning

Choose a project from the colour-coded section that will encourage pupils to apply their knowledge and skills from the content that they have covered in class. Although science is the subject area upon which most of the projects are based, skills and understanding from other curricular areas (geography, mathematics, SPHE and visual arts) will come into play in a cross-curricular fashion, depending on the project. The final project in each section (Project 7) is designed to be a longer-term project. Pupils' interests and abilities should guide the decision on which project(s) to choose.

Differentiating

STEM projects naturally allow for differentiation, as the focus is on the process rather than the product. This means pupils are able to choose the level of detail they put into their project. Mixed-ability groupings will assist pupils to complete the task without requiring the project requirements to change. For pupils who need more support, group them together with an adult assistant for targeted instruction. When pupils' skills develop, return them to mixed-ability groups.

Teaching

Before commencing each session, read through the task, the criteria and the materials. Place pupils in groups and give each group a project card (optional). Discuss the design process with reference to the design process icons on the back of each project card.

Assessing

Observations and anecdotal notes should be made consistently throughout the project and used to guide the pupil's learning in future projects. Assessment should focus on the pupil's application of their science knowledge, science inquiry skills, design and technology skills, digital technology skills, mathematics knowledge and interpersonal skills.



CLASSROOM MANAGEMENT

Grouping Pupils

It is recommended that:

- pupils work in small groups of four to six pupils. There are six copies of each card to allow up to six groups; and
- pupils work in mixed-ability groupings to allow pupils to use their personal strengths and weaknesses to assist group members or seek help.

Adult Assistance

It is recommended that:

- an education assistant and/or parent volunteers be used during STEM projects to aid pupils in reading the information on the cards. Alternatively, read through and discuss each project as a class before each session; and
- adult assistance is only provided to read or write information correctly, to guide pupils with how to go about finding solutions and to prompt pupils with the design process and conflict management strategies.

RESOURCE MANAGEMENT

Organisation of Materials

It is recommended that:

- a designated area is established to store common materials that pupils may need;
- pupils are reminded about resource management, sharing resources and sustainability throughout each project; and
- some materials be pre-prepared, such as materials that require cutting, to aid pupils in completing the project efficiently.

Behaviour Management

It is recommended that:

- safety considerations be discussed with pupils prior to and during each project; and
- constant low-key behaviour management strategies, such as proximity and verbal cues, be used to reduce behaviour issues from arising during projects.

Materials Required for all Projects

It is recommended that pupils have access to:

- common stationery items, such as scissors, pencils, rulers and glue sticks;
- common art and craft materials, such as PVA glue, paintbrushes, paper, crêpe paper and collage materials;
- a range of fiction and non-fiction books relating to the project topic; and
- digital technology devices, such as iPads[®], computers and digital cameras.

Suggested Materials Required for Individual Projects

Suggested materials required for each project are listed on the project card and the overview for the related colour-coded section. The materials are all easily accessed from school resources, home and community donations or from local hardware, gardening, food or craft shops. Recipes for salt dough and playdough can be found by conducting a search on the Internet.

DESIGN PROCESS



Contact your local SALES REPRESENTATIVE ORDER TODAY! Wilcash your curiosity. ORDER TODAY!