



# STEAM



Science, Technology, Engineering, Art and Maths

“Integral to STEAM education is the provision of opportunities for children to have direct experiences and engage in real-world problems” (Counsell, 2016)

## What is STEAM?

STEAM is a curriculum which integrates the five subjects of science, technology, engineering, art and mathematics together. Rather than teaching them individually they are taught cohesively. STEAM allows pupils to see how the different subjects support and complement one another. At All Saints School we believe STEAM is a fantastic way of learning the skills involved both in our daily lives and field of work. It provides students with the opportunity to learn both practically and creatively.

## The importance of STEAM:

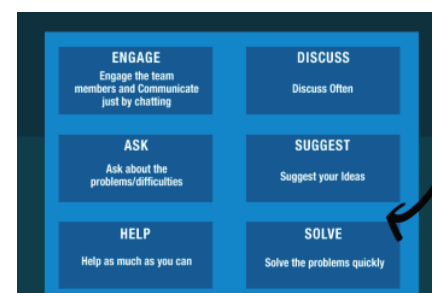
STEAM has a lot of significance for the world as it has range of benefits for countless fields, which involve one or more of the STEAM fields. Employees within these fields play an essential role in sustaining the growth and stability of the economy. The STEAM sector is expected to be one of the largest employers in the world since new technologies are being developed constantly and the numbers are only expected to rise. STEAM education helps stimulate interest in future STEAM careers as well as teaching and enhancing pupils critical thinking, problem-solving skills, team-work skills and many more important life skills.

## How does STEAM help students?

Pupils love a challenge and have a sense of curiosity. STEAM inspires this curiosity and sparks their imagination by giving them a range of challenges which allows them to think outside the box and become more creative. This enables them to explore and connect their ideas, enabling them to maximise their capabilities and giving them the skills and confidence to pursue courses in the STEAM fields. STEAM also requires a lot of team work skills allowing them to develop their social skills. Therefore, pupils will learn how to take different opinions into account and come to an agreement, which are all skills needed in the real world.

## The importance of a team player:

Part of the real world involves being a team player. To enable successful STEAM activities, it is important to work together as a team, this will not only help increase the value of learning for the pupils in the classroom, but it will also help challenges run smoother. If students understand both the value and the importance of being in a team they will not only use their skills more effectively but they will become more obligated and engaged when answering challenging questions.



## Weekly STEAM Challenges:

Weekly challenges are provided for all form groups. They consist of a range of activities which link to a combination of subjects in STEAM. The students are able to complete the tasks in groups, as a class or independently. The activities inform and educate the pupils. They also enable pupils to link different subjects together as well as giving them a recap. For example, some of the challenges consist of changing measurements, converting units, vocabulary skills and many more. Since we have introduced ART within STEM (now known STEAM) we have challenges which involve incredible art work from famous artists. Furthermore, for Black History Month, the weekly challenges involved many important Black scientists, mathematicians, engineers, surgeons, doctors and many more who have made amazing discoveries and differences. The pupils are able to learn about the great impact they have made in the world we live in today.

**BLACK HISTORY MONTH**

**Fern Hunt (1948-Present)**  
Fern Hunt is best known for her work in applied mathematics and mathematical biology. Throughout her great career, she has been involved with biomathematics, patterns in genetic variation, and chaos theory.

**Score 1 point for each correct answer.**

Mathematics: a) In your mind, roll the cube: forward, left, left, forward, right, backwards, right. Where's the dot now?  
b) Imagine the same cube with the dot. Roll the cube: forward, right, right, forward, left, backwards, left. Where's the dot now?

This is a self-portrait of the famous Mexican artist FRIDA KAHLO. Consider **how** and **why** Frida Kahlo has created a portrait around the theme **IDENTITY**.  
What do you see? Does this have meaning?  
THINK ABOUT...  
♦ why she has painted herself twice  
♦ The meaning of what she is wearing  
♦ Why they are connected at the heart

## What can we do?

To enable pupils to have a better insight into STEAM. Both teachers, parents, yourself and others can help assist students.

## Reading

STEAM is about linking content with the perspective of the world. Reading can open a door to successful people they can look up to, to different careers, thoughts, concepts and places. At All Saints Schools Miss Whiley has put in place DEAR which is a fantastic way to incorporate reading on a daily basis. This promotes a positive outlook on reading whilst expanding their literacy skills.

## Cooking/Baking

Getting the students to try new recipes at home allows pupils to familiarize themselves with fractions (asking questions such as is a  $\frac{1}{2}$  cup bigger than  $\frac{1}{4}$ ). They may even need to adapt the recipe by changing and converting measurements for the group size they are cooking/baking for. It also links to temperatures and geometry (what size is a 6 x 2 inch round pan) this allows pupils to exercise their visual learning skills.

## Coding

Coding is becoming a lot more important in our society. Digital job market continues to develop at a quick rate. Coding can open up a range of career opportunities as well as enhance creativity.

## Websites such as:

- <https://code.org>
- <https://www.tynker.com>
- <https://www.stem.org.uk/home-learning/secondary-computing>

These websites are very interactive as well as educational. Coding is great for both adults and students. At All Saints School, during computer science the students have a coding program which enables them to put their skills to practice.

### **Using Supplies at Home**

STEAM at home does not need to be complex or involve excess material. All you need is critical thinking, creativity, persistence and items you already have at home. For example, Cardboard boxes, newspaper, duct tape, wooden blocks even Legos are all a few examples of materials you may have lying around at home, which pupils can start getting creative with. They can be used to build structures, complete challenges and complete a range of online STEAM tasks.

Websites such as:

- <https://www.stem.org.uk/resources/collection/3729/secondary-school-resources>
- <https://education.theiet.org/secondary/>
- <https://www.stem.org.uk/home-learning/secondary-design-technology>
- <https://www.stem.org.uk/home-learning/family-activities>

These websites can be used to give guidance or ideas. By using the materials, you have at home, this can allow pupils to put their creativity to practice. All of this links to the design & engineering aspects of STEAM!

At All Saints School, the STEAM ambassadors as well as pupils from a range of year groups were able to get involved and complete challenges during STEAM club. The students were able to work together in teams, build structures or answer challenging questions based around different topics. After the challenges, the students would reflect using a self-evaluation sheet to see what aspects they both flourished in and what could be improved on for next time.

#### **Team Member Self-evaluation**

*To the student: Think about yourself as a "team player." Look back at your role on the team and fill out answers for this form. Share with your teacher and with fellow team members if you like.*



What were you supposed to do? \_\_\_\_\_

What did you do well? \_\_\_\_\_

What would you do differently if you had the chance to do the activity again? \_\_\_\_\_

### **Trips**

At All Saints School the students have been given the opportunity to attend many trips and events which have been a fantastic learning experience for the pupils. The pupils have worked together very well as a team, to achieve the objectives required in a range of STEAM challenges and competitions.

## Excel London

The event included many people from different backgrounds and fields in STEAM to help stimulate interest and encouraged the students to pursue opportunities in these creative sectors. Pupils enjoyed listening to the different aspects involved in the Engineering industry and they had the opportunity to complete challenges, where pupils had to work in teams and work together to solve the tasks set. This event enabled pupils to really think about the different aspects and routes to employment and inspire them to pursue careers in STEAM.

## Faraday Challenge

The challenge was based around the James Webb Space telescope. They pupils had to plan a realistic solution for the engineering problems involved with the making of the telescope.

The teams had to design a prototype of their designs and ideas, they were scored on planning, cost control, presentation and team work skills. The team work skills shown from our pupils was outstanding throughout the challenge, they were absolutely fantastic! They all had specific roles and designed an amazing prototype

The teams involved in the challenge had to then pitch their solutions at the end of the day, the STEAM ambassadors from All Saints School were extremely proud of their design and pitched their solutions with confidence! Which resulted in them being the WINNING team! They were awarded with a stunning trophy as well amazon vouchers each.



## Construction Youth Centre

This session aimed to get students thinking about how their maths studies relate to the world of work, specifically the role of quantity surveying. The session included a practical classroom-measuring activity supplemented by worksheet-based calculations.

The pupils seemed to enjoy the practical aspect which involved using a tape measure to measure the spaces around the room. This gave pupils a more realistic aspect to metric units, area and volume. Pupils were also more aware of careers within construction and routes into the industry.



## ET Savoy London

All Saints pupils celebrated their achievements with other teams from the Jack Petchey Foundation sponsored events.

There were many awards up for grabs, including the coveted student's choice. The pupils had to create a **display** within a short space of time using the title **'Why space exploration is important and what next?'** which displayed the reason as to why they feel space exploration, such as the work of the James Webb Space Telescope team, is important for all of us.

The STEAM ambassadors spent their time during school as well as after school to complete the project to the best of their ability. The All Saints students were very creative and innovative especially considering the time limit they were given and this was reflected in their display. They were awarded certificates and Jack Petchey badges for all their hard work and achievements.

winning



### **Science and Technology Day**

Students were challenged in mixed school groups on the following topics

- Medical
- Robotics
- Coding
- Algorithms

There were several different challenges one of the challenges was the 'Robotics challenge' where each team was provided with the latest mind storm robot which they would need to program in order to move around a certain course.



The E-fit challenge was something the All Saint's students learned how the E-FIT software worked and were encouraged to consider the problems associated with memory and with facial recognition.

**If you have any questions or further assistance, please email:**

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