

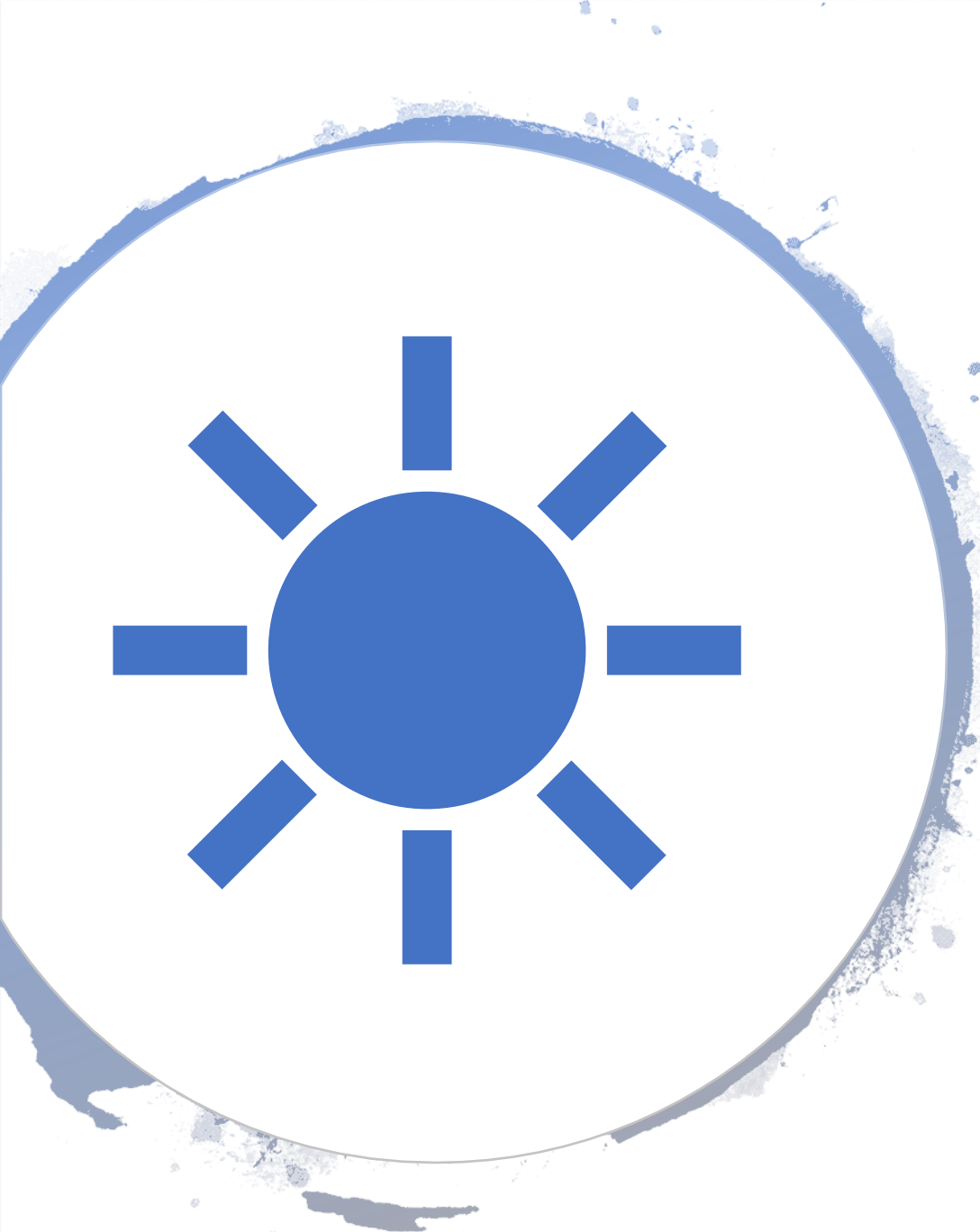
The background of the slide is a collage of engineering-related images. It features technical drawings of various mechanical parts, including gears, shafts, and bearings. A prominent image is a close-up of a ball bearing. To the right, there is a portion of a metal ruler with markings. The overall color scheme is a light, monochromatic blue.

# Engineering Summer School Project

## BTEC L2 & L3 Engineering

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July 2021



# Hello Students!

- You will hopefully be joining us in September and we would like you to carry out some tasks to make up a short project during the summer.
- The tasks are linked to the units that you will be taking during the first year of your L3 & L2 BTEC Engineering course.
- We would like you to carry out these tasks during the summer and bring them along with you once you start your lessons.
- Parts will possibly form part of an "Ice-Breaker" during sessions in your first week.

# Tasks to introduce Engineering Product Design and Manufacturing

## Task 1:

Freehand sketching of three items. Mobile phone, water bottle, chair.

## Task 2:

If you have been asked to design a folding chair, describe the components or mechanism that could be used to enable it to fold up. How do you think this chair could be manufactured ?

(Max single side of A4, or maybe a short Powerpoint).

# Task to introduce Engineering Maths

- Hello! Welcome to Maths revision. It is important for you to revise your maths skills ready for September.
- Lots of your courses will need some basic maths skills, so we need you to come in ready.
- We will be asking you to enrol on Khan Academy and work on a couple of specific areas.
- Some of this will feel really easy, but will help your brain to get back into maths mode after the long break.
- Some of it might feel quite tough, in which case you can use the videos and worked solutions to help you out.
- It is better to commit to ten minutes a day, than to try to blitz it all in one session.

# Khan Academy Enrolment – Engineering Maths

- Go to <http://www.khanacademy.org>
  - Select “Sign up” then “Learner” (College will not have access to your personal details)
  - Username - Please make this your first name and your surname so we know who you are!
- Once you have signed up you will need to join the class
  - Please go to <https://www.khanacademy.org/join/GY2C4ZTA>

# What to study- Maths

- **If you aim to join a level 3 course then please study**
  - Arithmetic – All parts [Arithmetic | Khan Academy](#)
  - Pre-algebra – All parts [Pre-algebra | Khan Academy](#)
  - Algebra 1 – Foundations [Foundations | Algebra basics | Math | Khan Academy](#)
  - If you want to study more, select what interests you!
- **If you aim to join a level 2 course then please study**
  - Arithmetic – All parts [Arithmetic | Khan Academy](#)
  - Pre-algebra – we will study a lot of this in class, but you can get a head start looking at [Pre-algebra | Khan Academy](#)
  - Again, if you want to study more, select what interests you!

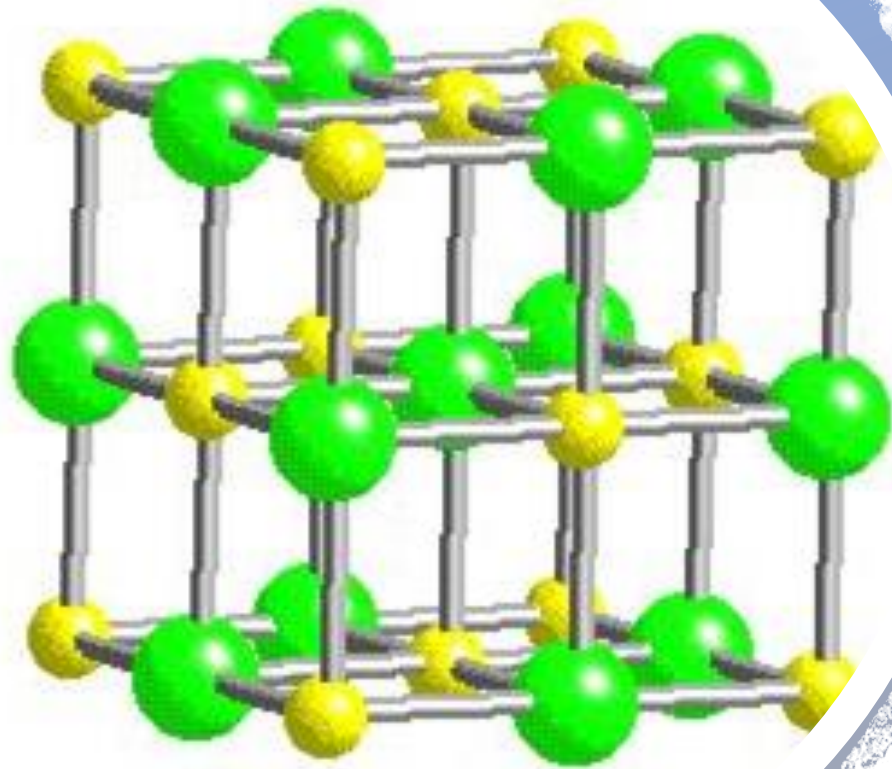
# Task to introduce Engineering Principles

- Taking measurements, planning a test, recording and analysing results and understanding what they mean are all important tasks for engineers.
- Follow the link below to the National Physical Laboratory's Measurement at Home experiment on how temperature affects the bounciness of balls, read the instructions, watch the YouTube clip and bring in your table of results to college in September!
- Good luck!
- [Temperature bounce - NPL](#)

# Task to introduce Electronics

- Circuit design and simulation
- Please go to : Multisim .com
- Sign up: Alias, Name, Role (student), school, email, password, CREATE ACCOUNT
  
- Create a circuit of your choice ( Any random circuit )
  
- Then, design, build and simulate Circuit1: Simple LED circuit
- <https://www.multisim.com/content/FY3Vj9T22DTFDLKPcsouxW/simple-led-circuit/>
- 
- Also design, build and simulate Circuit2: LED Flasher using 555
- Application e.g. Bike light or vehicle warning light
- <https://www.multisim.com/content/EPkdvE3kKXQKH8EPCEBz2b/alternating-led-flasher-v1/>





# Tasks to introduce Materials

## Crystallography

This teaching and learning package provides the fundamental ideas and principles associated with the field of crystallography.

Crystallography studies the microstructure of metals and ionic compounds and its understanding is essential when it comes to explaining these materials' behavior.

Follow the link provided and explore the fascinating world of metallic materials.

<https://www.doitpoms.ac.uk/tlplib/crystallography3/index.php>

# Introduction to Dislocations

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**Dislocations** are crucially important in determining the mechanical behavior of materials.

This teaching and learning package provides an introduction to dislocations and their motion through a crystal.

A 'bubble raft' model is used to demonstrate some of the features of dislocations and other lattice defects. Some methods for observing real dislocations in materials are examined. Lattice defects play a crucial role to the materials' behavior under stress.

Follow the link provided and explore the fascinating world of metallic materials.

<https://www.doitpoms.ac.uk/tlplib/dislocations/index.php>



## Deformation Processes.

This teaching and learning package covers the fundamentals of metal forming processes.

Follow the link provided and explore the fascinating world of metallic materials

<https://www.doitpoms.ac.uk/tlplib/metal-forming-2/index.php>



# See you in September

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