BT Group

The IoT: a world of connectivity

Lesson 3

Resources

- PowerPoint presentation

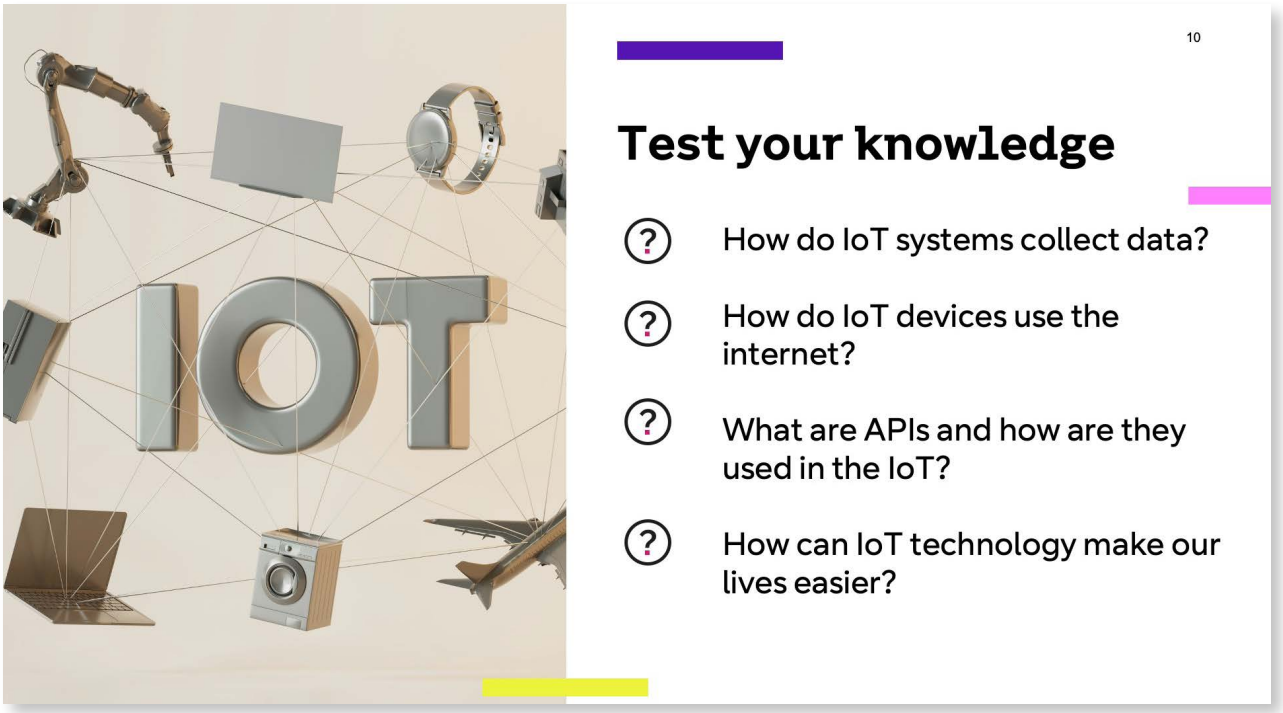
Intro (10 mins)
Slides 1-8

Introduction

Use the slides to introduce the lesson, the module overview, and learning objective for today. Make sure to recap the 'Big Thinking' question on slide 4: should smart devices be allowed to make decisions for us without our consent?

Use slide 9 to test students' knowledge. Answers are provided below:

- IoT systems collect data from places such as sensors in our homes, microphones on our phones, etc.
- IoT devices use the internet to connect with each other and share this data
- APIs are used to instruct databases, servers and other data sources on what information is required
- IoT technology can make our lives easier by:
  - Automating processes so that we don't have to worry about doing them manually
  - Helping us to efficiently access and share information from large distances



Resources

- PowerPoint presentation
- Access to internet (YouTube)
- Pens and paper
- Internet-connected devices (1 per group)
- Product planning template

Activity 2 (15 mins)
Slides 10-14

Project brief

Read the scenario and brief on slide 11. Give students the opportunity to ask questions and make sure everyone fully understands the task, before getting students into groups.

> You have a job at a company working on tech innovations that make everyday things like backpacks, water bottles, and even lunchboxes 'smart'.
>
> Imagine an IoT product that could tell you where you left your backpack or causes your water bottle to light up when you haven't been drinking enough water, or a device that tells you how healthy the food in your lunchbox is.
>
> Your challenge is to devise your own IoT product idea.
>
> You'll need to think about:
>
> - how your device works and how it uses the IoT
> - how you'll make sure data collected is secure and the permissions you'll need to gather from your users
> - any potential risks that your device could pose

Explain that to bring their products to life, students are going to create a 3D visual using TinkerCAD, a digital modelling programme. Play the following short introductory video on slide 12 to give students a flavour of how it works (there will be chances to learn more about how to use it later on): https://www.youtube.com/watch?v=LrU2zm_g7lE

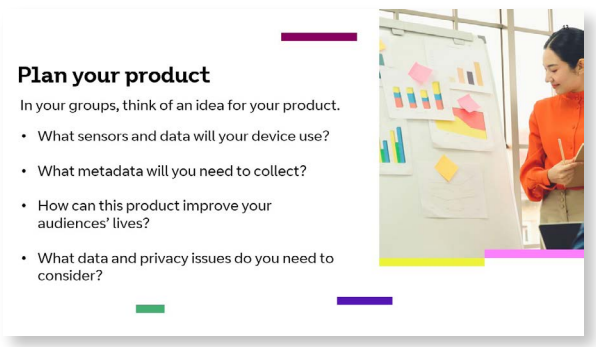
Highlight that this is similar to software that would be used in 3D design and other digital/tech careers. If you have time, generate a brief discussion on the technical and human skills students should be able to develop in this task (e.g. creative thinking, problem solving, teamwork, the ability to use digital design software).

Product ideas and planning

Using the 'product planning template', allow groups some time to come up with their product ideas, and use the questions on slide 13 to make sure they can demonstrate the technical capabilities and how their product will work:

- What sensors and data will their device use?
- What metadata will they need to collect?
- How can this product improve their audiences' lives?
- What data and privacy issues do you need to consider?

Capturing the answers to these questions will be essential for presenting their product in pitch in the next session. Explain that this planning stage is very important, and many digital product designers use similar planning techniques in the real world of work.



Resources

- PowerPoint presentation
- TinkerCAD classroom set up (see instructions at the start of this activity)
- Internet-connected devices (1 per group)

Activity 2 (25 mins)
Slides 14-15

Design your product

As an educator you can set up a classroom on TinkerCAD which allows students to join in 'Safe mode'. It's recommended that you do this ahead of the session:

1. Go to www.tinkercad.com/join
2. Click 'Educator'
3. Click continue and agree to the terms on the next two pages
4. Go to 'Classes' in the left-hand menu
5. Click on 'Create new class' - create a name, select the age group and subject
6. Once created, you can share a class link and code with the students so that they can join your classroom and start their work. There is space on slide 10 for you to copy and paste the link and code

Give each group an internet-connected device so that they can join your TinkerCAD classroom using the instructions on slide 15.

- Show students where they can find tutorials on the different ways to use the programme
- Support students to start placing, viewing and moving their product design
- Make sure teams are dividing up the task fairly and giving each member a chance to try using the different tools
- Remind students to keep referring back to their product plan, noting down any changes or improvement they make and the reasons why. Remind them that their plan will be key to helping them build their presentation
- Ask students to add their background information in the knowledge tab

Bring students back together and let them know that next session there will be a short amount of time to finish their designs, and then they will be planning a presentation to share their product with the rest of the class.

TinkerCAD time

To access TinkerCAD:

Following this link: _____ Enter this code:_____

Check out these 3D design tutorials to get to grips with the programme:

Resources

- PowerPoint presentation

Plenary (5 mins)

Reflect on learning

Finish off the lesson by asking students what they think makes a good IoT product. Encourage them to think about:

- protecting user's data
- making everyday tasks easier

Then recap with students the importance of planning a product before it is designed.