Demonstrators Notes

(if using Power Point)

Learning level	Suitable for all ages
Research themes	Blueprints for healthy animals Control of Infectious Diseases Improving Animal Production & Welfare
Duration	20 minutes to 40 minutes

Timings

Slide 1 -2

Welcome slide and title slide (2 min)

Lab coats on, welcome, health and safety, fire drill, toilet instructions

Introduction to activity.

Slide 3

Have you seen this type of picture before? (1 mins)

One of the most common techniques used in science laboratories is called micropipetting, which allows scientists to transfer very small and precise amounts of liquids. It is essential for scientists to conduct proper experiments while developing biotechnology products that can have fatal results if not done well. Just like any other profession, there are a set of techniques and protocols that every scientist follows in the lab to keep them and the public safe.

Slide 4 – 7 (2 mins to 5 mins if using micropipettes)

Students are instructed how to micropipette

Younger participants can use the fixed volumes pipettes (red and green); older participants can use micropipettes.

Explain how to hold the pipette correctly, upright and with your thumb on the plunger and not any other finger. This gives better control.

Demonstrate holding pipette while you say this

Scientists use micropipettes are used to measure out very small volumes very accurately.

We all know that 1 litre = 1000ml. One ml is composed of 1000 what?

Setting the volume (only if using micropipettes)

To practice, they will set the volume on the 1-20µl pipettes to 10 µl.

To set the volume, explain that they need to turn the dial on the pipette.

Can you set the pipette for 10ml? (only if using micropipettes)

Students set their pipettes and check their answers.

The micropipetting steps (5 mins) (only if using micropipettes)

Students put the pipettes down and watch the steps of microopipetting.

Students practice pipetting using any colour dye and the micropipetting cards (one per student)

Playing with pipettes

What does 10µl look like?		
What does 5µl look like?		
What does 2.5µl look like?		

Slide 9

Pipetting and Art (30 seconds)

Though many don't see the connection between art and science, the fact is that they have long existed and developed collaboratively. Great thinkers like the legendary Leonardo Da Vinci and the renowned Chinese polymath Su Song. Artists have also been borrowing techniques and tools from biotechnology to produce pieces of art.

Pipetting dots of paint to create a picture mimics a painting technique called Pointillism. This technique was made famous by artists Georges Seurat and Paul Signac in the 19th century.

Slide 10

Create your own masterpieces (10 mins)

Each student should have one card each and a pallet of paint between 2. Older participants can use the racks with the eppendorfs to increase the complexity of the activity.

Slide 11

Tweet masterpieces (2 mins)

Encourage them to take photos of their art work and tweet it.

Thank you, lab coats off, tidy bench.

How to engage with the public => during the "create your masterpiece" part

To ask the participants:

- Do you do any artistic activity during your free time? (painting, photography…)
- What about when you were a kid?
- Do you like to go to art museums? What's your favourite type of art/art style?
- Have you been to a science workshop/festival before?
- Have you heard of the Roslin Institute and the research that is conducted there?

Talk about yourself!

- How did you become a scientist? / Did you always want to be a scientist? If not, what other careers have you considered? / If you hadn't become a scientist, what would you have been?
- What's your favourite thing about being a scientist?
- Explain your research subject in simple words (no jargon!)
- Do you also take part in artistic activities in your free time?

These are just ideas to start the conversation, but feel free to discuss any subject !

Demonstrators Notes (if not using Power Point)

Biotech Skills
Pipetting Pointillism

Activity duration app. 20mins (can be extended)

- **Welcome and introduction to the workshop**

Lab coats on, welcome, health and safety, fire drill, toilet instructions

Introduction to activity.

- **Show the image of the scientist with the micropipette: have you seen this type of picture before? (1 mins)**

One of the most common techniques used in science laboratories is called micropipetting, which allows scientists to transfer very small and precise amounts of liquids. It is essential for scientists to conduct proper experiments while developing biotechnology products that can have fatal results if not done well. Just like any other profession, there are a set of techniques and protocols that every scientist follows in the lab to keep them and the public safe.

- **Give the pipetting instructions (2 mins to 5 mins if using micropipettes)**

Students are instructed how to micropipette

Younger participants can use the fixed volumes pipettes (red and green); older participants can use micropipettes.

Explain how to hold the pipette correctly, upright and with your thumb on the plunger and not any other finger. This gives better control.

Demonstrate holding pipette while you say this

Scientists use micropipettes are used to measure out very small volumes very accurately.

We all know that 1 litre = 1000ml. One ml is composed of 1000 what?

Setting the volume (only if using micropipettes)

To practice, they will set the volume on the 1-20µl pipettes to 10 µl.

To set the volume, explain that they need to turn the dial on the pipette.

Can you set the pipette for 10ml? **(only if using micropipettes)**

Students set their pipettes and check their answers.

The micropipetting steps (5 mins) (only if using micropipettes)

Students put the pipettes down and watch the steps of micropipetting.

Students practice pipetting using any colour dye and the micropipetting cards (one per student)

Playing with pipettes

What does 10µl look like?		
What does 5µl look like?		
What does 2.5µl look like?		

- **Pipetting and Art : show paintings (30 seconds)**

Though many don't see the connection between art and science, the fact is that they have long existed and developed collaboratively. Great thinkers like the legendary Leonardo Da Vinci and the renowned Chinese polymath Su Song. Artists have also been borrowing techniques and tools from biotechnology to produce pieces of art.

Pipetting dots of paint to create a picture mimics a painting technique called Pointillism. This technique was made famous by artists Georges Seurat and Paul Signac in the 19th century.

- **Create your own masterpieces (10 mins)**

Each student should have one card each and a pallet of paint between 2. Older participants can use the racks with the eppendorfs to increase the complexity of the activity.

- **Tweet masterpieces (2 mins)**

Encourage them to take photos of their art work and tweet it.

Thank you, lab coats off, tidy bench.

How to engage with the public => during the "create your masterpiece" part

To ask the participants:

- Do you do any artistic activity during your free time? (painting, photography…)
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- Do you like to go to art museums? What's your favourite type of art/art style?
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Talk about yourself!

- How did you become a scientist? / Did you always want to be a scientist? If not, what other careers have you considered? / If you hadn't become a scientist, what would you have been?
- What's your favourite thing about being a scientist?
- Explain your research subject in simple words (no jargon!) => the cards with the drawings can help introducing your research
- Do you also take part in artistic activities in your free time?

These are just ideas to start the conversation, but feel free to discuss any subjects !