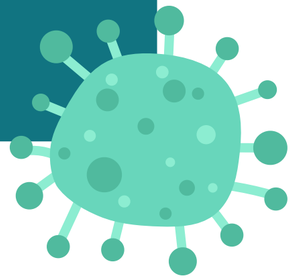
Vaccine Development Pipeline



Lesson created by Olivia Shorthouse, University of Manchester, Holly Sedgwick, University of Manchester, and Rachel Hindmarsh, University of Oxford
as part of the *Thanks for the Memories* Public Engagement Project

Thanks for the Memories

wellcome

NUFFIELD DEPARTMENT of MEDICINE

UNIVERSITY OF OXFORD

MANCHESTER 1824
The University of Manchester

PRiSM
THE RNCM CENTRE FOR PRACTICE & RESEARCH in SCIENCE & MUSIC

Learning Objectives

1. Understand the key steps involved in developing a vaccine
2. Identify different careers associated with the development pipeline
3. Explain how scientific research helps solve real-world problems and improve public health

Let’s recap what we have learnt so far about vaccines and the immune system.

First of all - what is immune memory?

How does your body ‘remember’ an infection it has encountered before?

Why is immune memory useful?

Natural Immunity

Artificial Immunity

Natural Immunity

OR

Artificial Immunity

?

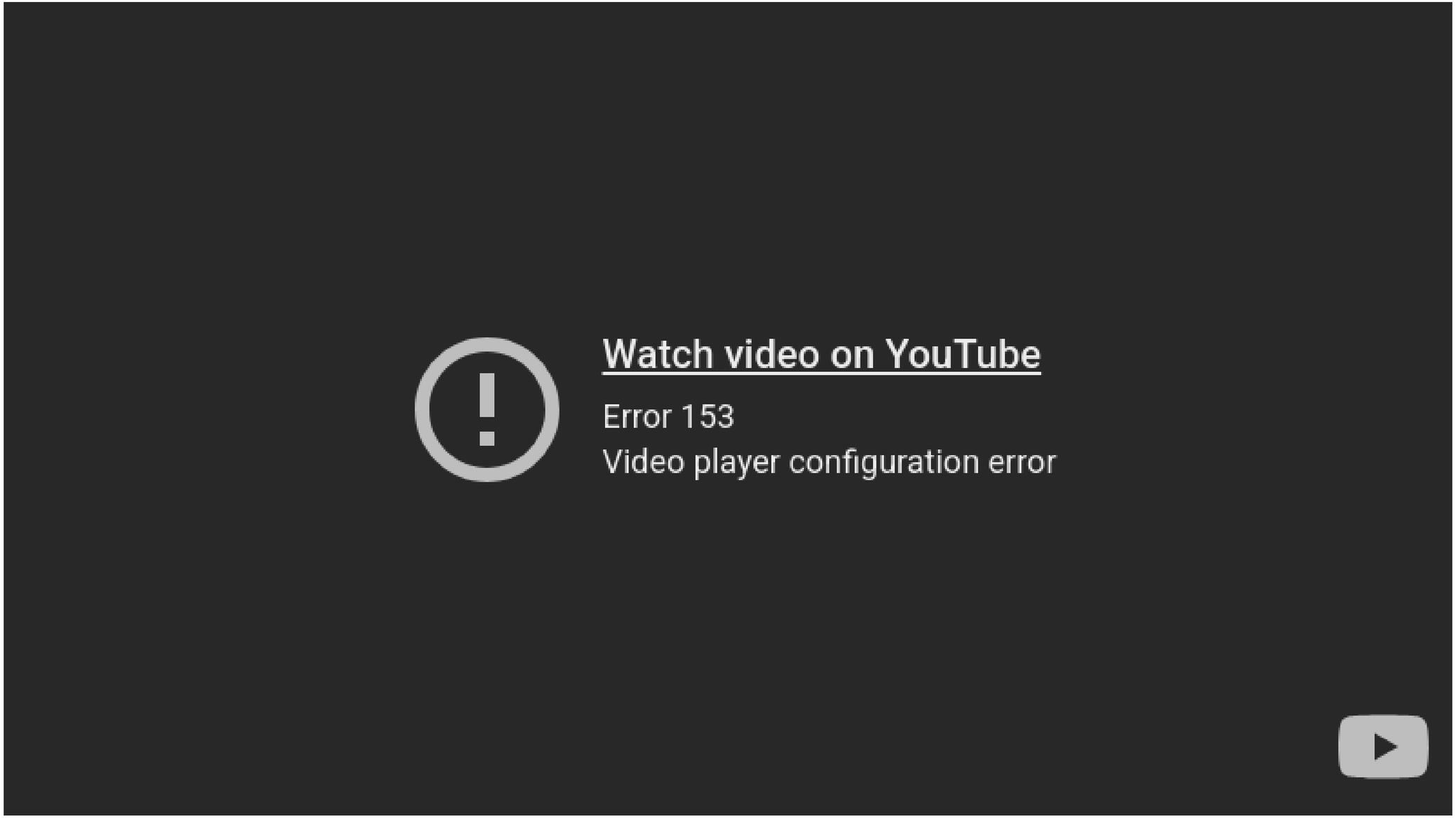
You catch chickenpox from a friend and don’t get it again

You receive a travel vaccine before going abroad

Your body fights off a cold without any medicine

You get the HPV vaccine at school

You had COVID-19 once and now you have some protection


Watch video on YouTube
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Activity 1: Vaccine Pipeline

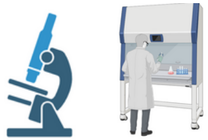
1. What are the main steps in developing a vaccine, from research to public use? Visit each station and take notes on what happens at each stage.

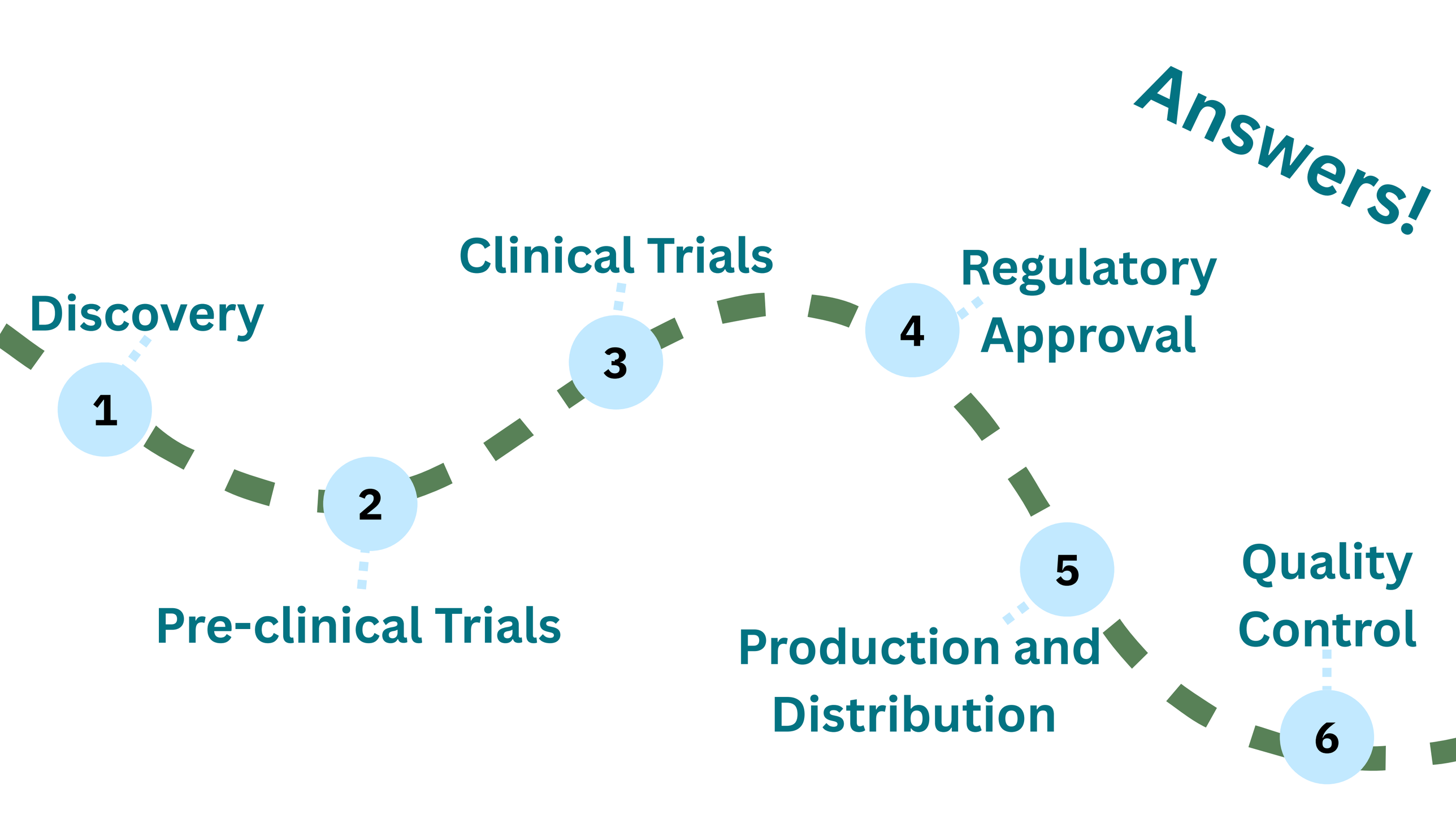
2. Arrange the stages - on your own - into the correct chronological order

3. Explain why you have chosen this order to the person sat next to you

4. Make a flowchart on your worksheet with 2 bullet points for each step. Check with the person sat next to you, and add anything missing

Activity 1: Vaccine Pipeline

CLINICAL TRIALS 	**PRODUCTION AND DISTRIBUTION** 
PRE-CLINICAL TESTS 	**DISCOVERY** 
QUALITY CONTROL 	**REGULATORY APPROVAL**  


Answers!
Discovery
1
Pre-clinical Trials
2
Clinical Trials
3
Regulatory Approval
4
Production and Distribution
5
Quality Control
6

Activity 2: Career Spotlight

1. You will be given a career identity card - read this card carefully, and keep your identity a secret.

2. Walk around the room and ask classmates questions to figure out what career identity they have. Try to match their career to a clue on your bingo sheet

3. When you find someone who fits a clue, write their name in that box. The fastest person to complete their bingo sheet wins!

Someone who works in a lab	Someone who works with patients	Someone who checks medicine quality
Someone who needs a university degree		Someone who writes safety reports
Someone who teaches the public	Someone who works in a factory	Someone who explains science to others

Write on your worksheet another example of a disease where scientific research helped human health. What do you find most interesting about your example?

Some examples...

Penicillin

Smallpox

Quick Quiz!

Is a vaccine natural or artificial immunity?

Quick Quiz!

What is the main goal of a vaccine?

Quick Quiz!

Who decides whether a vaccine is safe enough to be used in the public?

Quick Quiz!

Why might you need a vaccine booster shot?

Quick Quiz!

Answers!

1. Is a vaccine natural or artificial immunity? A vaccine gives artificial immunity because it is made and given to you on purpose to protect against disease.
2. What is the main goal of a vaccine? The main goal of a vaccine is to train your immune system to recognise and fight a specific disease without making you seriously ill.
3. Who decides whether a vaccine is safe enough to be used in the public? Government health agencies like the MHRA (in the UK) or FDA (in the US) decide if a vaccine is safe and effective for public use.
4. Why might vaccines need a booster shot? Booster shots are needed when immunity weakens over time or to improve protection against new versions of a virus.

Reflection

Write a sentence about what job you might like from the career spotlight activity, and why