Topic Lesson Plans

Topic: Testing

Each Topic starts with an introduction, designed to help introduce the content and encourage students to start to explore more about the topic.

There then follows a Topic Lesson Plan. Topic Lesson Plans are designed to be used by you to deliver the teaching and learning for the topic. Collectively, they should form a small scheme of work with a selection of student activities to bring the topic to life.

Each Topic Lesson Plan includes 3 or 4 activities that are designed to support the learning of the topic to your students, enabling them to develop the Knowledge, Understanding and Skills and provide an opportunity for formative assessment.

The Topic Lesson Plans should be used in conjunction with the following documents:

- Testing Introduction PowerPoint
- Testing Industry Resource Links
- Links to Assessment

Introduction to the topic: Testing
Software testing is the process of verifying a system with the purpose of identifying any errors, gaps or missing requirement versus the actual requirement. Software testing is broadly categorised into two types - functional testing and non-functional testing. Testing covers all of the main elements of: • software • hardware • data • interfaces • resulting service It also covers testing and quality assurance methodologies that aim to seek out problems and identify and resolve issues. While it's important to test that users can use an application (I can log in, I can save an object) it is equally important to test that a system doesn't break when bad data is inputted or unexpected actions are performed. Companies need to anticipate what would happen when a user makes a typo, tries to save an incomplete form, or uses the wrong API. They need to check if someone can easily compromise data or get access to a resource they're not supposed to. A good testing suite should try to break an app and help understand its limits.

Quality should be the prime intention of every tester whether it is manual or automation. A good tester will always focus on improving the quality of the product and not just on finding defects.

Introduction to the Topic Lesson Plans

These lesson plans cover all the elements of software testing. A program, once created, must be fully tested and understood in order to improve upon it and have it ready for release.

These lesson plans cover developing testing plans, as well as understanding the key elements of testing, while aiming to understand the types of tests that must be done, and why they are important.

There are lesson plans for tests using python and how to code and create tests with python.

Finally, they lead onto creating testing plans, and understanding the nature of tests in order to create a high quality program.

Topic Lesson Plan No: 1	
Title	Testing
Aim and objective	Be able to test systems using specific structures or coding languages.
How long will this Topic Lesson Plan take to deliver?	240 minutes
What knowledge, understanding and skills will students develop?	2.8.1 Understand the fundamental importance of testing 2.8.5 Understand how to construct an effective test plan.
Self-study activities	https://realpython.com/tutorials/testing/
Activity 1:	
Title	Unit testing in Python
How long will this activity take to deliver?	60 minutes
Instructions	Go to the website and follow the tutorial on conducting unit tests in python.
Worksheets / templates	https://www.datacamp.com/community/tutorials/unit-testing-python
English, maths and digital skills	E5 Synthesise information. M1 Measuring with precision. M2 Estimating, calculating and error spotting. M3 Working with proportion. M4 Using rules and formulae. M5 Processing data. M6 Understanding data and risk. D4 Process and analyse numerical data. D5 Be safe and responsible online. D6 Code and program.
Industry Links	https://docs.python-guide.org/writing/tests/

Activity 2:	
Title	Writing your first tests in Python
How long will this	60 minutes

activity take to deliver?	
Instructions	Go to the website and follow the tutorials on writing tests in python using simple data files. Complete: - Writing your first test - Executing your first test
Worksheets / templates	https://realpython.com/python-testing/#writing-your-first-test
English, maths and digital skills	E5 Synthesise information. M1 Measuring with precision. M2 Estimating, calculating and error spotting. M3 Working with proportion. M4 Using rules and formulae. M5 Processing data. M6 Understanding data and risk. D4 Process and analyse numerical data. D5 Be safe and responsible online. D6 Code and program.
Industry Links	https://docs.python-guide.org/writing/tests/

Activity 3:	
Title	Simple testing in Python (60 mins)
How long will this activity take to deliver?	60 minutes
Instructions:	Follow the tests on the website for the following types of test: • Unit testing • Factorial Testing • Functional Testing • Mathlib Testing
Worksheets / templates	https://pymbook.readthedocs.io/en/latest/testing.html
English, maths and digital skills	E5 Synthesise information. M1 Measuring with precision. M2 Estimating, calculating and error spotting. M3 Working with proportion. M4 Using rules and formulae. M5 Processing data.

	M6 Understanding data and risk. D4 Process and analyse numerical data. D5 Be safe and responsible online. D6 Code and program.
Industry Links	https://www.fullstackpython.com/integration-testing.html

Activity 4:	
Title	Check Data
How long will this activity take to deliver?	60 minutes
Instructions	Using the dataset, import it into excel to graph and chart it to identify potential data in the following ranges: • Valid • Valid extreme • Invalid • Invalid extreme • Erroneous
Worksheets / templates	https://www.kaggle.com/gregorut/videogamesales
English, maths and digital skills	E5 Synthesise information. M1 Measuring with precision. M2 Estimating, calculating and error spotting. M3 Working with proportion. M4 Using rules and formulae. M5 Processing data. M6 Understanding data and risk. D4 Process and analyse numerical data. D5 Be safe and responsible online. D6 Code and program.
Industry Links	https://www.kaggle.com/datasets

Topic Lesson Plan No: 2	
Title	Creating Test Plans
Aim and objective	The aim of the lesson plan is to show different ways to develop testing plan skills and when and why to test elements.
How long will this Topic Lesson Plan take to deliver?	190 minutes.
What knowledge, understanding and skills will students develop?	2.8.2 Understand the use of testing and quality assurance methodologies to seek out problems and issues 2.8.4 Understand how to apply root cause analysis to solve problems 2.8.5 Understand how to construct an effective test plan
Self-study activities	https://www.edx.org/course/software-testing-fundamentals
Activity 1:	
Title	What goes in a testing plan?
How long will this activity take to deliver?	30 minutes
Instructions	A test plan includes a product description, objectives, testing strategies, scope, schedule, procedures, testing resources, and deliverables. The learners need to create a podcast/vodcast explaining the key elements of a testing plan and why they are needed in a test plan.
Worksheets / templates	NA
English, maths and digital skills	E1 Convey technical information to different audiences. E2 Present information and ideas. E3 Create texts for different purposes and audiences. D1 Use digital technology and media effectively. D2 Design, create and edit documents and digital media.
Industry Links	https://www.guru99.com/what-everybody-ought-to-know-about-test-planing.html

Activity 2:	
Title	Testing a game

How long will this activity take to deliver?	90 minutes
Instructions	Using your favourite game. Choose a level from it and write a testing plan using one of the templates below. Play the game and complete the tests looking for anomalous and failed tests.
Worksheets / templates	https://www.template.net/business/plan-templates/simple-test-plan/
English, maths and digital skills	E5 Synthesise information. M1 Measuring with precision. M2 Estimating, calculating and error spotting. M6 Understanding data and risk. D4 Process and analyse numerical data. D6 Code and program.
Industry Links	https://www.testbytes.net/blog/types-of-game-testing/

Activity 3:	
Title	Testing DEMOQA
How long will this activity take to deliver?	60 minutes
Instructions	Using the website: https://demoqa.com/ And using a simple testing plan template (one within the resource file) draw up a simple testing plan for testing the website and follow and complete the tests.
Worksheets / templates	https://www.guru99.com/test-plan-for-project.html
English, maths and digital skills	E5 Synthesise information. M1 Measuring with precision. M2 Estimating, calculating and error spotting. M6 Understanding data and risk. D4 Process and analyse numerical data. D6 Code and program.
Industry Links	https://huddle.eurostarsoftwaretesting.com/test-plan-not-old-school/
Topic Lesson Plan No: 3	

Title	Why we test
Aim and objective	Develop an understanding of why we test and what purposes testing serves.
How long will this Topic Lesson Plan take to deliver?	120 minutes.
What knowledge, understanding and skills will students develop?	2.8.1 Understand the fundamental importance of testing 2.8.3 Understand how automated and functional testing tools can be applied to test digital systems and code 2.8.5 Understand how to construct an effective test plan.
Self-study activities	https://www.coursera.org/learn/introduction-software-testing
4: Activity 1:	
Title	Radio Show
How long will this activity take to deliver?	30 minutes
Instructions	You need to create a short radio show for production. This would be designed for being streamed to students in a college to understand why we test. It needs to cover all main components that are tested and covered as per 2.8.1, and then presented in an accessible format.
Worksheets / templates	NA
English, maths and digital skills	E1 Convey technical information to different audiences. E2 Present information and ideas. E3 Create texts for different purposes and audiences. E4 Summarise information/ideas. E5 Synthesise information. E6 Take part in/lead discussions. D1 Use digital technology and media effectively. D2 Design, create and edit documents and digital media. D3 Communicate and collaborate.
Industry Links	https://www.softwaretestingmaterial.com/software-testing/

4: Activity 2:	
Title	Pinterest Mood board

How long will this activity take to deliver?	30 minutes
Instructions	Pin a mood board to Pinterest on types of automated and functional testing tools that can be used to test digital systems and code. Extension Task: On each of the pins write the reason why it was pinned.
Worksheets / templates	https://www.pinterest.co.uk/
English, maths and digital skills	E1 Convey technical information to different audiences. E2 Present information and ideas. E3 Create texts for different purposes and audiences. E4 Summarise information/ideas. E5 Synthesise information. E6 Take part in/lead discussions. D1 Use digital technology and media effectively. D2 Design, create and edit documents and digital media. D3 Communicate and collaborate.
Industry Links	https://www.tutorialspoint.com/software_testing_dictionary/test_tools.htm

Activity 3:	
Title	The 5 whys
How long will this activity take to deliver?	30 minutes
Instructions	Get the students to think of a problem they are currently experiencing and complete the strategy template for this. NHS Template: https://www.strategyunitwm.nhs.uk/sites/default/files/2018-12/SU%20guide%20to...Five%20Whys.pdf
Worksheets / templates	https://www.strategyunitwm.nhs.uk/sites/default/files/2018-12/SU%20guide%20to...Five%20Whys.pdf
English, maths and digital skills	E1 Convey technical information to different audiences. E2 Present information and ideas. E3 Create texts for different purposes and audiences. E4 Summarise information/ideas. E5 Synthesise information. E6 Take part in/lead discussions.

	D1 Use digital technology and media effectively. D2 Design, create and edit documents and digital media. D3 Communicate and collaborate.
Industry Links	https://improvement.nhs.uk/resources/root-cause-analysis-using-five-whys/

Activity 4:	
Title	Game changing bugs
How long will this activity take to deliver?	30 minutes
Instructions	This is a research task. Ask the students to read the articles below on games that were released with massive game changing bugs. Working with a partner they should choose 2 games. They need to work through and identify: • What was wrong? • How could it have been identified? • What type of testing wasn't done? • What did the company do after? As a pair, they should then produce a presentation on their findings and present this to the class.
Worksheets / templates	https://www.goliath.com/gaming/10-games-that-were-broken-at-launch/ https://en.wikipedia.org/wiki/List_of_video_games_notable_for_negative_reception https://gamerant.com/broken-games-launch-batman-halo-diablo-155/
English, maths and digital skills	E1 Convey technical information to different audiences. E2 Present information and ideas. E3 Create texts for different purposes and audiences. E4 Summarise information/ideas. E5 Synthesise information. E6 Take part in/lead discussions. D1 Use digital technology and media effectively. D2 Design, create and edit documents and digital media. D3 Communicate and collaborate.

Industry Links	https://www.guru99.com/what-is-incremental-model-in-sdlc-advantages-disadvantages.html https://gametester.gg/