PDST

Professional Development Service for Teachers | An tSeirbhís um Fhorbairt Ghairmiúil do Mhúinteoirí

National Workshop 6

LEAVING CERTIFICATE
COMPUTER SCIENCE

Session 3

Post Phase 1 CPD
Review Phase 1
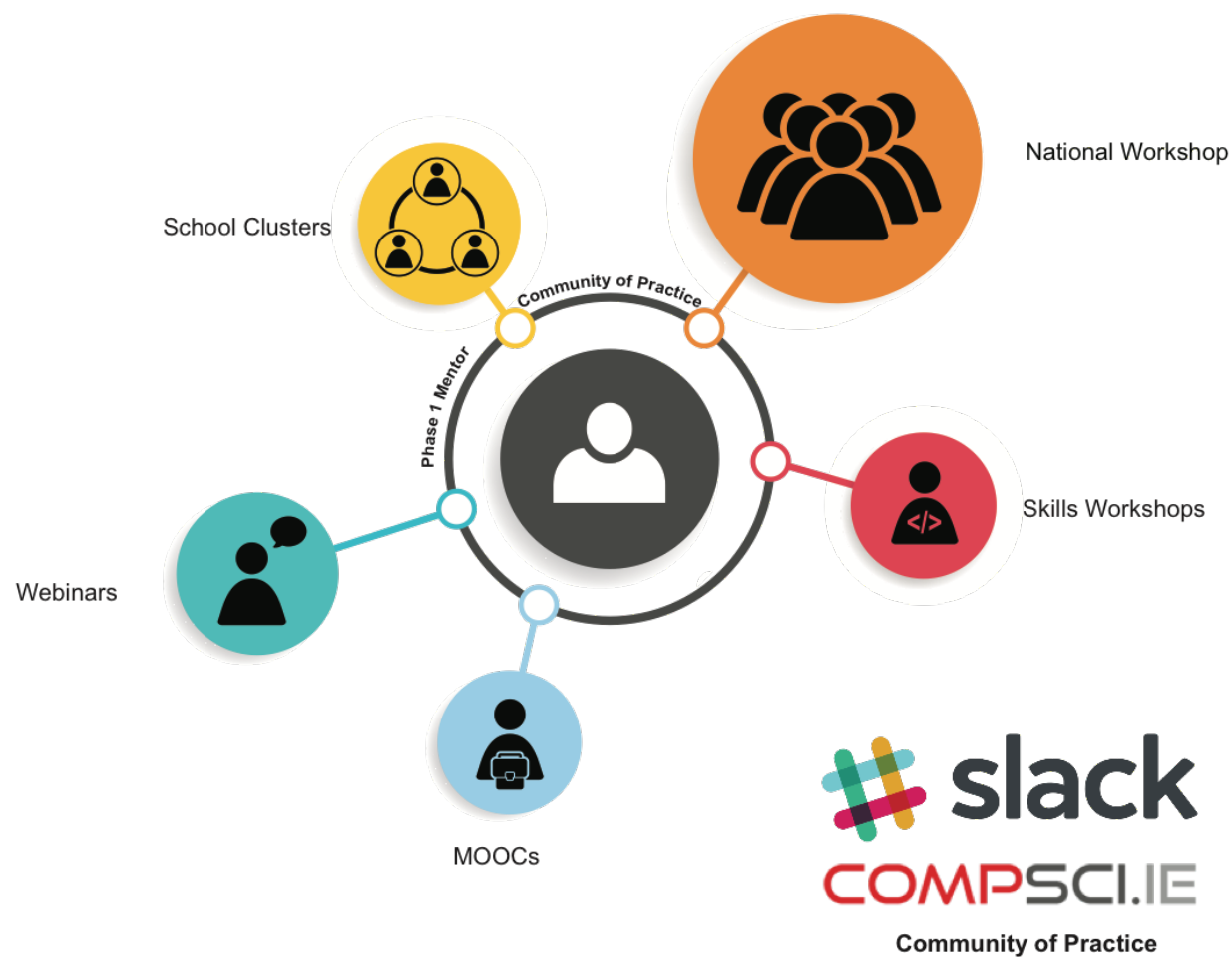
By the end of this session / Learning Outcomes

Participants will be enabled to:

- Understand the plans for post Phase 1 CPD for LCCS teachers.

- Review Senior Cycle Skills relating to Computer Science and reflect on their implementation in the classroom

- Bring different approaches and techniques for approaching various Computer Science areas (LOs 1.11-1.14. 1.18, 1.23)

- Explore Higher-Order Questioning in CS as part of Formative Assessment / Assessment As Learning (LOs 2.11 – 2.15, 2.17, 2.22, 1,19, 1.23)

- Design solutions in Python, deciding which range of the languages constructs / features to implement. (LOs 1.1 – 1.10, 1.19, 1.22, 2.2, 2,3, 2.5 – 2.7, 2.19)
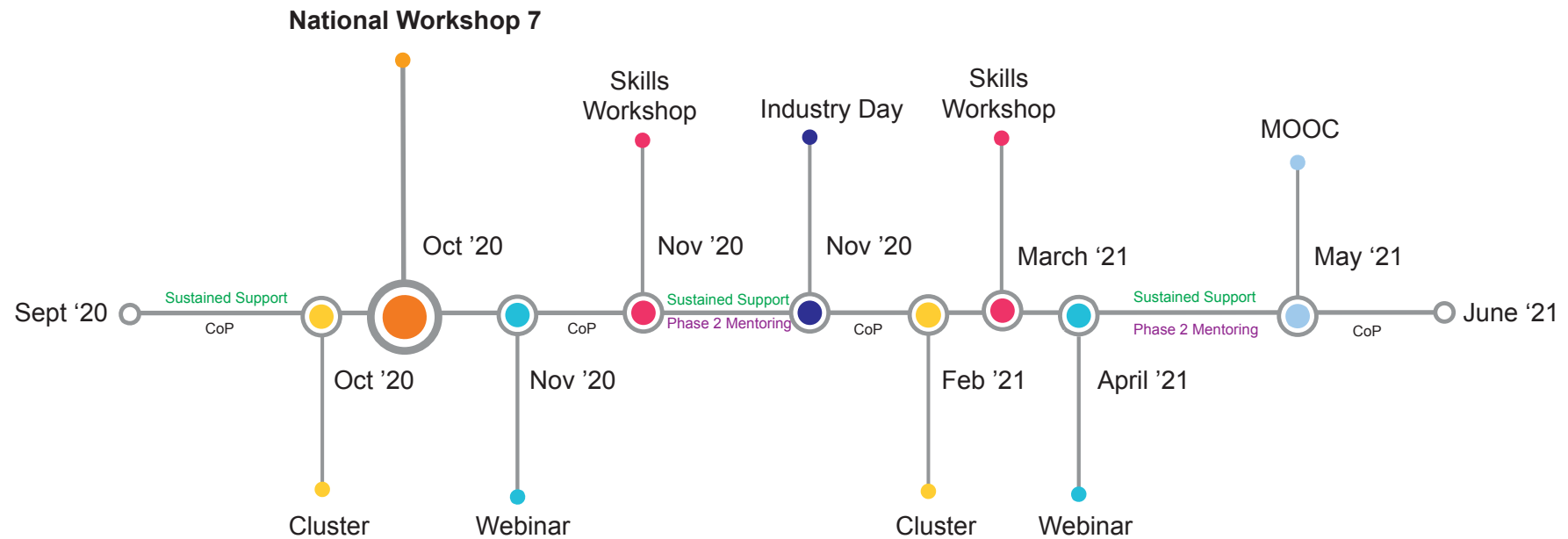
This Session

- Post Phase 1

- Senior Cycle Key Skills

- Case Study

- Design Higher Order Questions

- Python must-could-should

Post Phase 1 CPD

School Clusters

Community of Practice

National Workshop

Phase 1 Mentor

Skills Workshops

Webinars

MOOCs

slack

COMPSCI.IE

Community of Practice

Phase 1 Mentor

Overview of Framework

National Workshop 7

Skills Workshop

Industry Day

Skills Workshop

MOOC

Oct '20

Nov '20

Nov '20

March '21

May '21

Sept '20 — Sustained Support — CoP — Oct '20 — Nov '20 — Sustained Support / Phase 2 Mentoring — CoP — Feb '21 — Sustained Support / Phase 2 Mentoring — April '21 — CoP — June '21

Oct '20

Nov '20
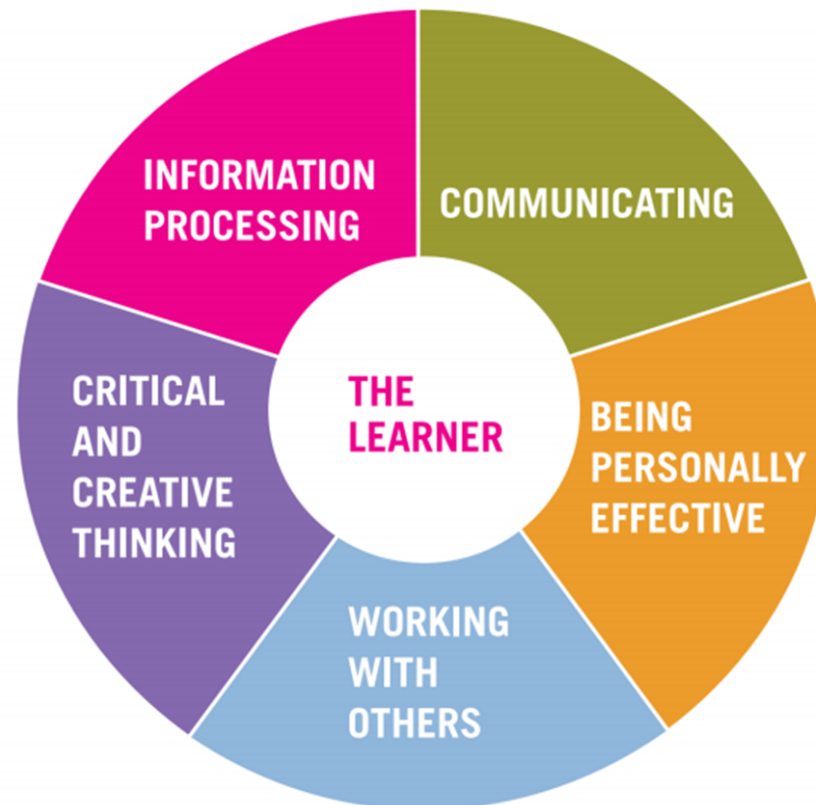
Cluster

Webinar

Cluster

Webinar

Timeline - Post Phase 1

Senior Cycle Key Skills

Activity

Teachers in groups discuss how key skills were demonstrated in their classrooms, and which skills were particularly enhanced during the course.

Senior Cycle Key Skills - NCCA

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Exploration of challenging LCCS themes through Formative Assessment

Summative vs Formative Assessment

Assessment OF Learning (Summative)	Assessment FOR Learning (Formative)
Happens after learning takes place	*An integral part of learning process*
Information is gathered by teacher	Information is shared with learner
Information is usually transferred into marks	Information is available on quality of learning
Comparison with performance of others	Is linked to learning intentions and success criteria
Looks back on past learning	*Looks forward to the next stage of learning*

Assessment for Learning / Assessment As Learning (Formative)

Assessment for learning involves teachers using evidence about students' knowledge, understanding and skills to inform their teaching. Sometimes referred to as 'formative assessment', it usually occurs throughout the teaching and learning process to *clarify student learning and understanding*.

Assessment as learning occurs when students *are their own assessors.* Students monitor their own learning, *ask questions* and use a range of strategies to decide what they know and can do, and how to use assessment for new learning.

Sections A+B

Apply Higher Order Questions:

Discuss / Compare and Contrast / Distinguish / Evaluate / Assess / Analyse …

Questions

Sample Key Examination Words

| Term	Explanation
Analyse	Examine in detail and/or break down into components.
Assess	Describe the positives and negatives, identify the importance of.
Calculate	Find out by way of mathematical formula or numerical data.
Compare	Show the similarities and differences between.
Contrast	Show the differences between.
Criticise/Critique	Point out weaknesses as well as strengths.
Define	Give the precise meaning of.
Derive	Work out from basic principles.
Describe	Give the details of properties, events, processes etc.
Discuss	Examine or describe in detail. Make arguments for and against.
Distinguish	Point out the differences.
Draw	Make a picture or diagram.
Evaluate	Discuss and make a judgement on.
Examine	Take apart and describe a concept in great detail.
Explain	Make clear in a detailed manner.
Identify	Show you recognise.
Illustrate	Give examples including figures, diagrams or examples
Interpret	Explain, comment on and pass judgement.
Justify	Give reasons to support the statement.
List	Provide parts, reasons or qualities in itemised point form.
Prove (or disprove)	Give evidence.
Relate	Show the links, connections and associations.
Review	Comment on the main aspects of a subject.
Show	Explain with example, diagram or chart.
State	Write briefly without further comment.
Suggest	Give possible reasons and ideas.
Summarise (outline)	Give the key points without details.
Trace	Show the steps or stages to be followed.

Summative Assessment

Course

Assessment

Ideal

Perfect
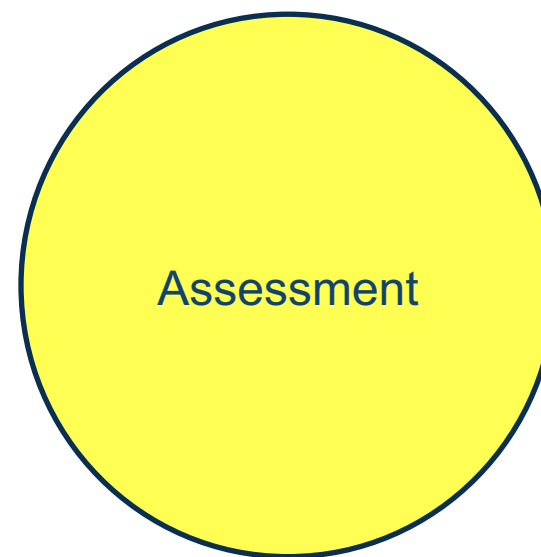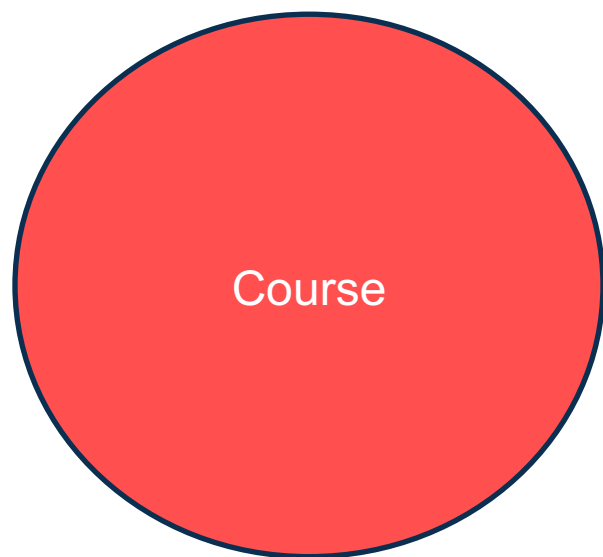
Reality
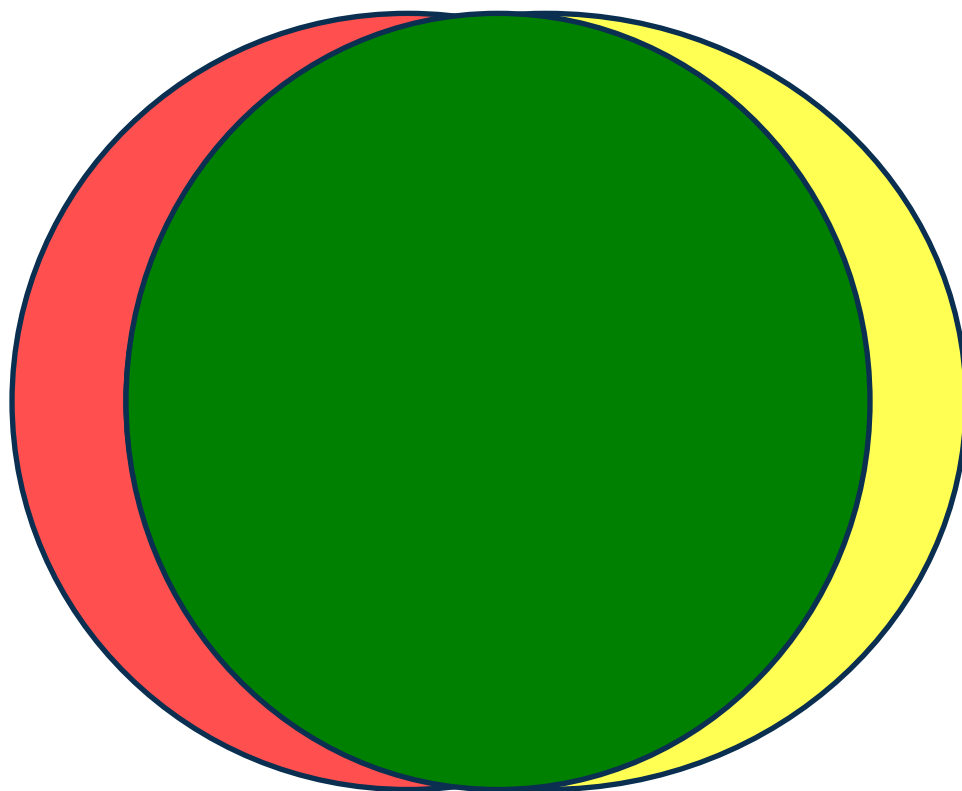
Activity based on Case Study

Read the Smithfield Software Company (SSC) case study and answer the questions which follow.

Case Study: Smithfield Software Company (SSC)

SSC develop IT solutions for different companies. One of their specialities is the development of education management software (eg Moodle).

Read the Case Study document of the introduction and customisation of Moodle into two educational establishments.

Waterfall v Agile

https://youtu.be/egF9-FejbsA

Microsoft Office - Waterfall

Release Date	Title
August 24, 1995	Office 95
June 20, 1997	Office 97
June 7, 1999	Office 2000
May 31, 2001	Office xp
August 19, 2003	Office 2003
January 30, 2007	Office 2007
April 15, 2010	Office 2010
January 29, 2010	Office 2013

Case Study Questions

- Which of the two implementations could be described as Waterfall Software Development and which as Agile Software Development?

- Draw a Development Cycle diagram for each of these.

- Evaluate both Methodologies and give advantages and disadvantages of both.

Discussion

Sections A+B

Assessment as Learning: Research the higher order questions

Activity – Exploring 'challenging' areas (AaL)

Choose an area from the specification which you may consider challenging and pose a question from the list of higher order questions shown.

Teachers will choose questions from other groups, research and come back with their results.
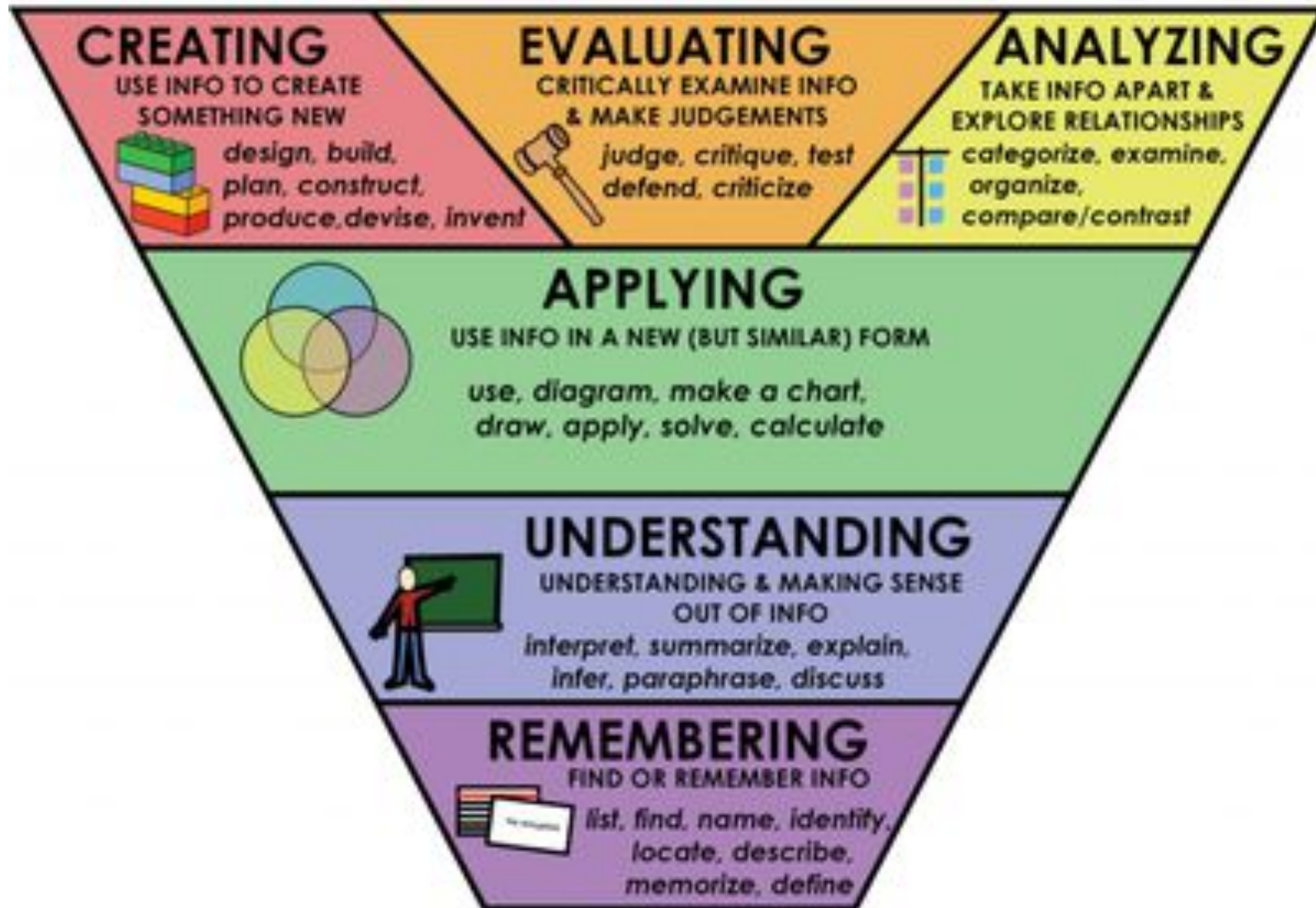
Example:
Distinguish between Artificial Intelligence and Machine Learning.

Sample Key Examination Words

Questions

Term	Explanation
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Show	Explain with example, diagram or chart.
State	Write briefly without further comment.
Suggest	Give possible reasons and ideas.
Summarise (outline)	Give the key points without details.
Trace	Show the steps or stages to be followed.

Bloom's Questioning

BLOOM'S TAXONOMY

CREATING
USE INFO TO CREATE SOMETHING NEW
design, build, plan, construct, produce, devise, invent

EVALUATING
CRITICALLY EXAMINE INFO & MAKE JUDGEMENTS
judge, critique, test defend, criticize

ANALYZING
TAKE INFO APART & EXPLORE RELATIONSHIPS
categorize, examine, organize, compare/contrast

APPLYING
USE INFO IN A NEW (BUT SIMILAR) FORM
use, diagram, make a chart, draw, apply, solve, calculate

UNDERSTANDING
UNDERSTANDING & MAKING SENSE OUT OF INFO
interpret, summarize, explain, infer, paraphrase, discuss

REMEMBERING
FIND OR REMEMBER INFO
list, find, name, identify, locate, describe, memorize, define

Higher Order Questioning youtube

https://youtu.be/o39ioXazamk

How to Revise for Computer Science
https://www.youtube.com/watch?v=ky0Rc2V1rR8

AaL: Descibe how and why you would use Heuristics in S'ware Projects

Crumbia:

Shop	Address	Telephone	County
Centra Laurel Lodge	Unit 10, Laurel Lodge SC	(01)8222045	D15
Mace Mulhuddart	M3 Services, Navan Rd	(01)8115214	D15
Spar Mulhuddart	Unit 2/3 Riverside	(01)8103033	D15
Spar Mullcrest	The Cresent, Mulhuddart	na (closed?)	D15
SV Tyrellstown	Tyrellstown	(01)8274004	D15
Spar Waterville	Waterville, Blanchardstown	(01)8219035	D15
Centra Corduff	Blackcourt Ave, Corduff	(01)8103439	D15
Spar Finnstown	Finnstown, Lucan	(01)6214203	Co Dublin
Mace Adamstown	Maxol, Newcastle, Adamstown	(01)5056484	Co Dublin
Centra Griffeen	7 Griffeen SC, Lucan	(01)6249111	Co Dublin
SV Neilstown	Unit 1, Rowlagh Villaga	(01)6200042	D22
Centra Neilstown	Neilstown SC	(01)4570088	D22
Centra Greenpark	Green Park SC	(01)4593521	D22
Mace Russell Sq	Fortunestown Rd	na	D24
Spar Belfry	Belfry Hall, Citywest	(01)4796573	D24
Spar Village Green	Village Green SC, Tallaght	(01)4590167	D24
Centra Old Bawn	Old Bawn Shopping Centre	(01)4662980	D24
Spar Oldcourt	Oldcourt SC, Firhouse	(01)4516887	D24

Activity - 2

Other possible areas:

- Pillars of Computational Thinking
- Internet, WWW
- Heuristics
- Impact of Computing in Culture and Society
- Universal Design Principles
- Careers using Computer Technologies
- Software Testing
- Computer components and their function
- Communication Protocols
- ASCII and Unicode
- Analytics
- Modelling and Simulation

Discussion

Section C

In groups walk through and discuss the 'could', 'should' and 'must' of Python syntax.

Discussion

Activity – Coronavirus statistics in various countries

Teachers in pairs come up with a solution, using Python code. Tabular data for this Coronavirus problem is on the next slide.

Teachers are required to find:
- Average rate of infection per million for the given European countries.
- Median rate of infection per million for the given European countries.
- Country with the highest rate of infection.
- Country with the lowest rate of infection.
- Country with the highest death rate.
- Country with the lowest death rate,

Activity (2) – Coronavirus data (24/3/20)

Country	Population (000's)	Cases	Deaths
Ireland (26 counties)	4,928	1329	7
Spain	46,768	42058	2991
Switzerland	8,638	9877	122
UK	67,803	8077	422
Italy	60,496	69178	6820
France	65,227	22304	1100
Netherlands	17,123	5560	276
Norway	5,408	2866	12
Sweden	10.082	2299	40
Portugal	10,205	2362	33
Germany	83,793	32991	159

Discussion

An Roinn Oideachais agus Scileanna
Department of Education and Skills