Assessment and Evaluation Tools in Education

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*:Original slides prepared in Turkish. English version translated for this workshop.

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ACTIVITY-1 (Warm-up Survey)

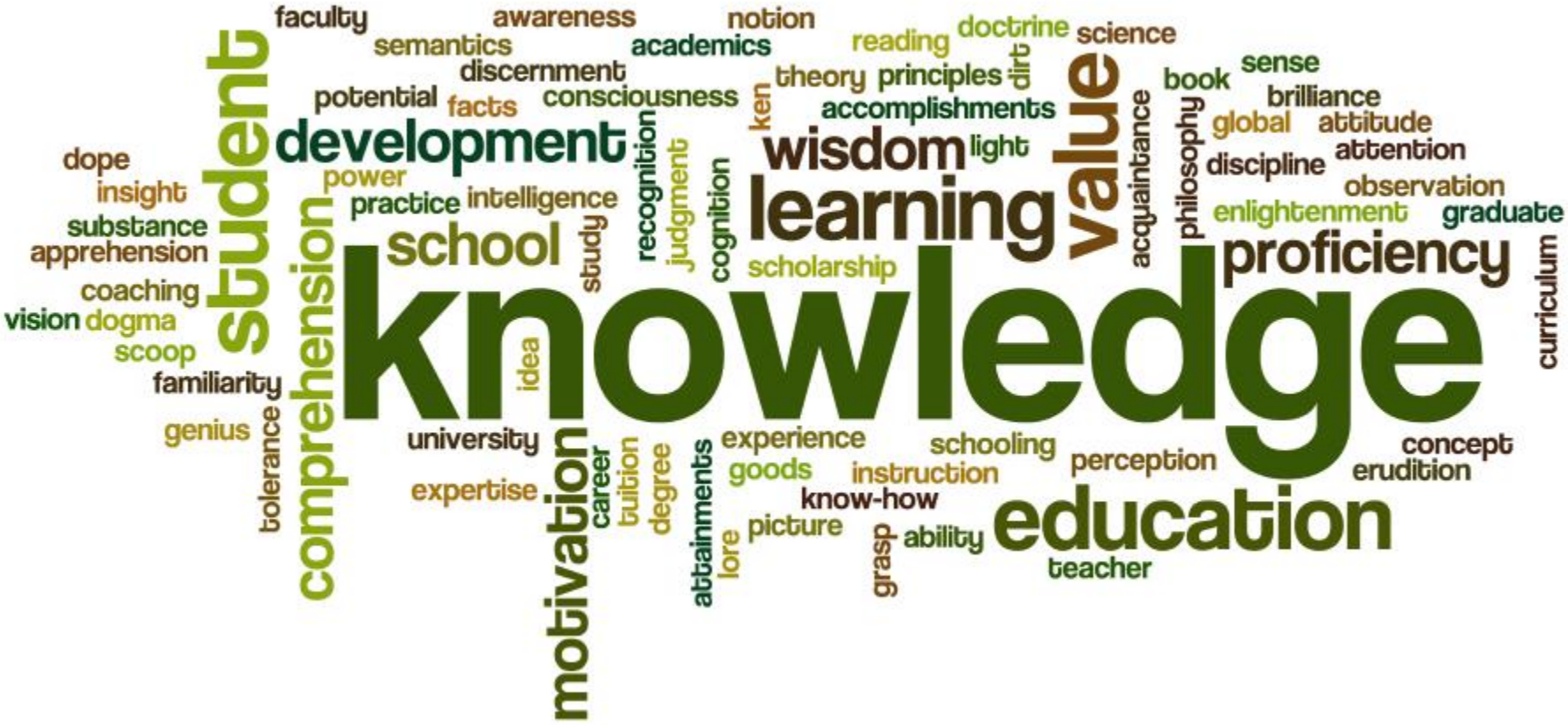
- Now we will do a small **interactive activity**.
- Scan the QR code: (next slide)
  - Your answers will instantly appear on the screen as a Word Cloud, allowing us to visualize and observe the overall trend.
  - When you think of "assessment and evaluation," what is the first thing that comes to your mind?
    - Hint: It can be an assessment tool.
    - It can be a method/technique.
    - Please provide only one word or term.

Note: Responses are anonymous and only used to see general trends.

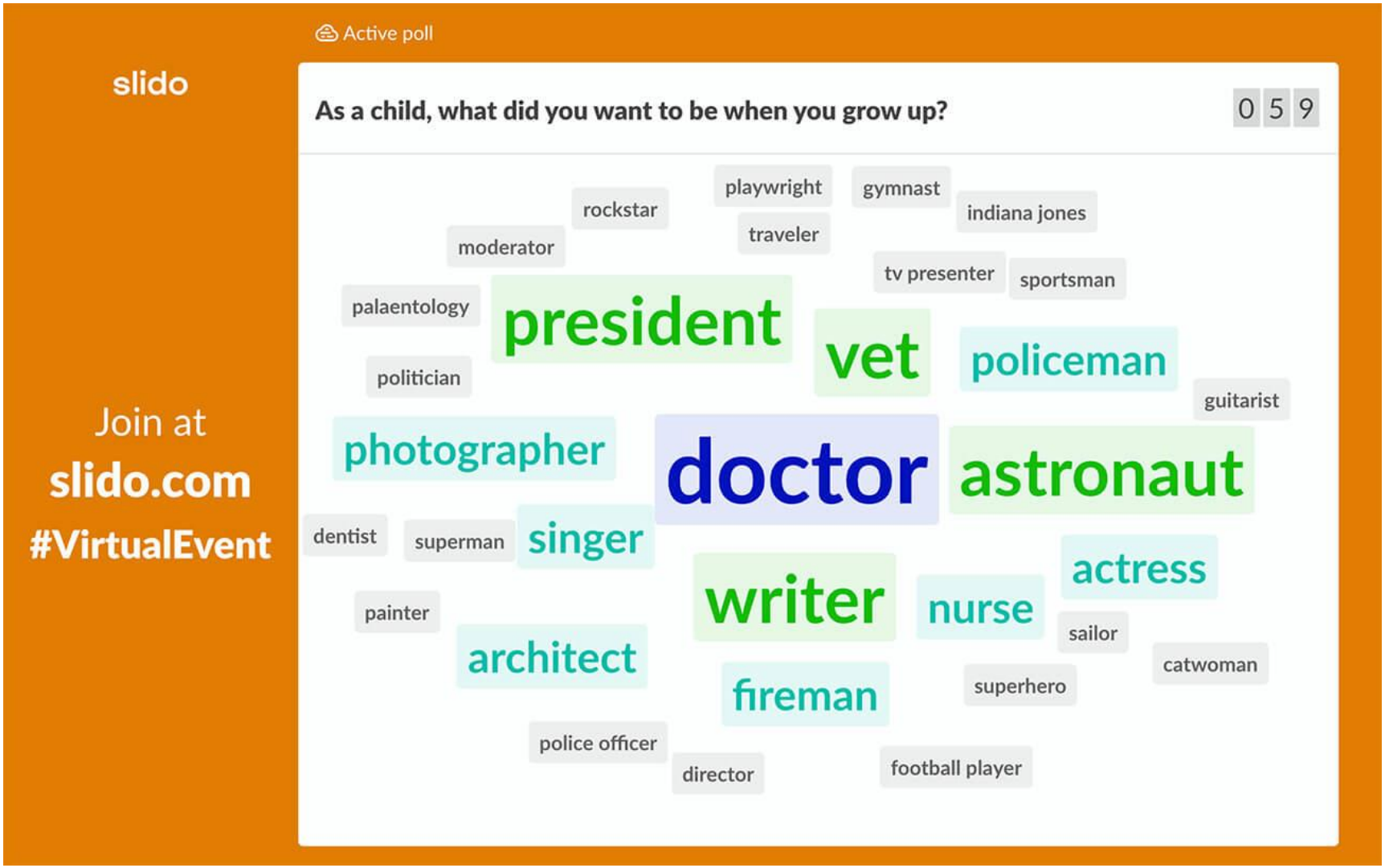
EVENT-1 (Group 5)

- Scan the **QR code**:

Sample Word Cloud



Sample Slido Word Cloud



1. Introduction, Key Questions

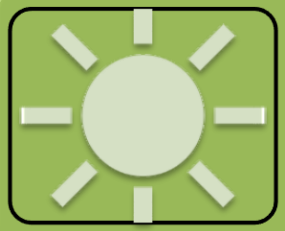
Introduction

- **What is Measurement?**
  Observing a characteristic (knowledge, skill, attitude) according to predetermined criteria and expressing it numerically.

- **What are Measurement Tools?**
  Written/oral exams, Tests, Performance tasks, Portfolios, Rubrics, etc.

Learning Domains (Bloom's Taxonomy)

Knowledge: What the student knows – facts, concepts, principles.



Skill: What the student can do. Application/procedure and psychomotor execution (e.g., experiment, coding, presentation).

Attitude: What the student feels, what he/she values, and how he/she behaves – interest, motivation, disposition.

Concrete Examples for **Bloom's Taxonomy**

Knowledge:

- Knowing the formula of quadratic equations in mathematics.
- Being able to define DNA in biology.
- Stating the years during which the War of Independence took place in history.
- Defining the concept of "variable" in programming.

Skill:

- Building a simple electric circuit in science class.
- Writing a "Hello World" program in coding.
- Performing a short dialogue in an English class.
- Preparing a presentation and explaining a topic in front of classmates.

Attitude:

- Taking responsibility and being open to collaboration in group work.
- Throwing waste into recycling bins with environmental awareness.
- Not giving up when making mistakes in a coding class, but continuing to try.
- Being willing and motivated to listen to new ideas.

Introduction

What is Evaluation?

Interpreting and making decisions based on measurement results according to set criteria.

- It shows to what extent the student has achieved the objectives.
- It is used in the decision-making process:
  - Success/Failure decision,
  - Which student needs which support,
  - Adequacy of teaching methods.

Introduction

What are the Types of Evaluation?

- **Formative Evaluation (Process-Oriented):** Provides instant or mid-term feedback during the learning process.
- **Summative Evaluation (Outcome-Oriented):** Determines the level at the end of learning, aimed at grading.

- **Diagnostic Evaluation:** Used before instruction. It focuses on assessing students' prior knowledge and skills before instruction begins.

Introduction

The difference between measurement and evaluation:

- Measurement collects data.
- Evaluation assigns meaning to the data.

➢ We measure first and then evaluate.

2. Measurement - Evaluation Tools

Traditional Tools

- Written Exam (open-ended, classical questions)
- Multiple-Choice Test
- Short Answer
- True–False
- Matching

Advantages: Objective scoring, rapid reporting.

Limitations: Limited measurement of high-level skills.

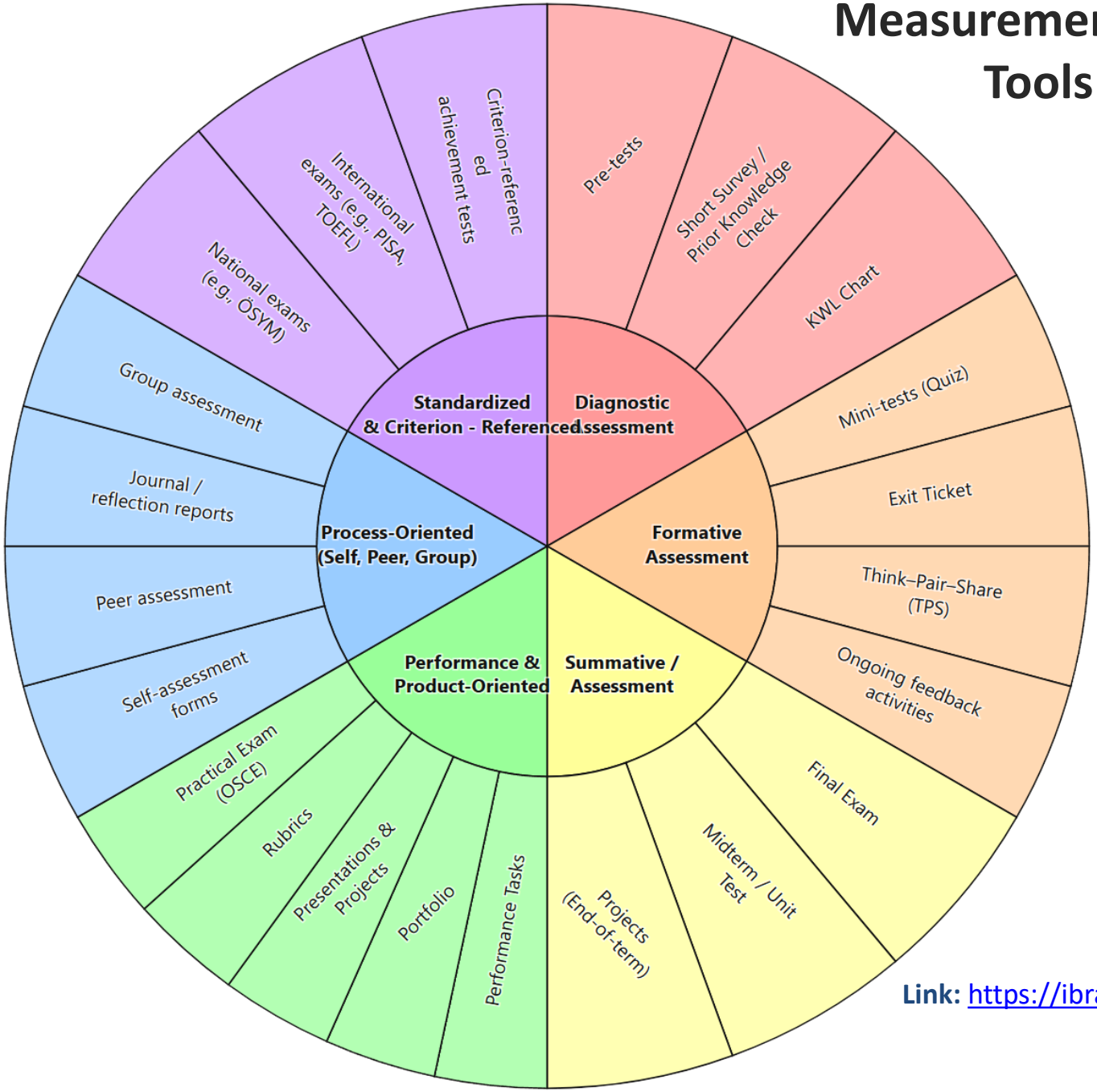
Alternative (Complementary) Tools

- Performance Tasks
- Project/Presentation
- Portfolio
- Rubrics
- Self-Assessment
- Peer Assessment

Advantages: Makes deep learning visible, based on real-life tasks.

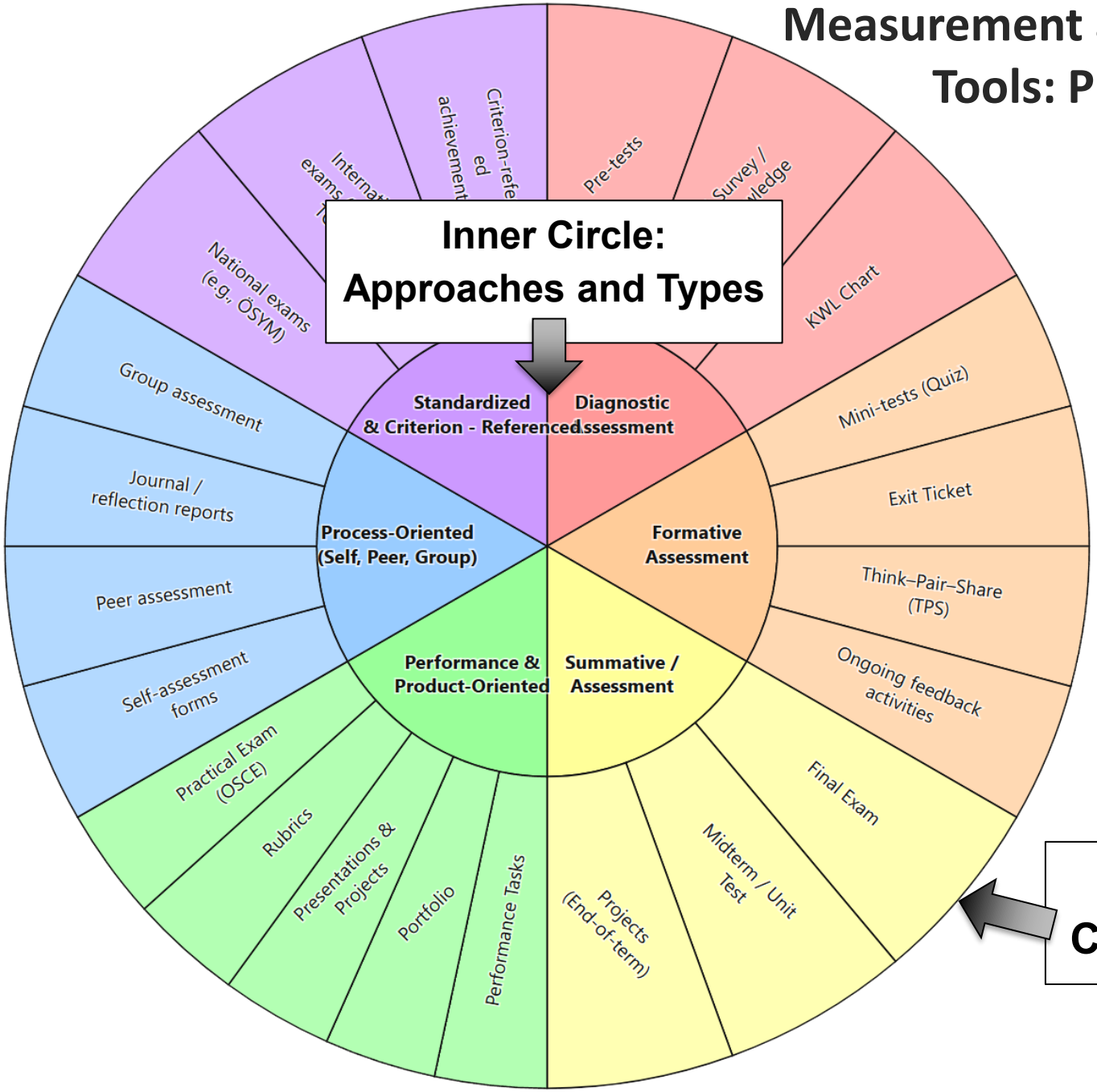
Limitations: Subjectivity in scoring and high time/cost requirements.

Measurement and Evaluation Tools: Pie Chart



Link: https://ibrahimkaya.com.tr/materyal/01/

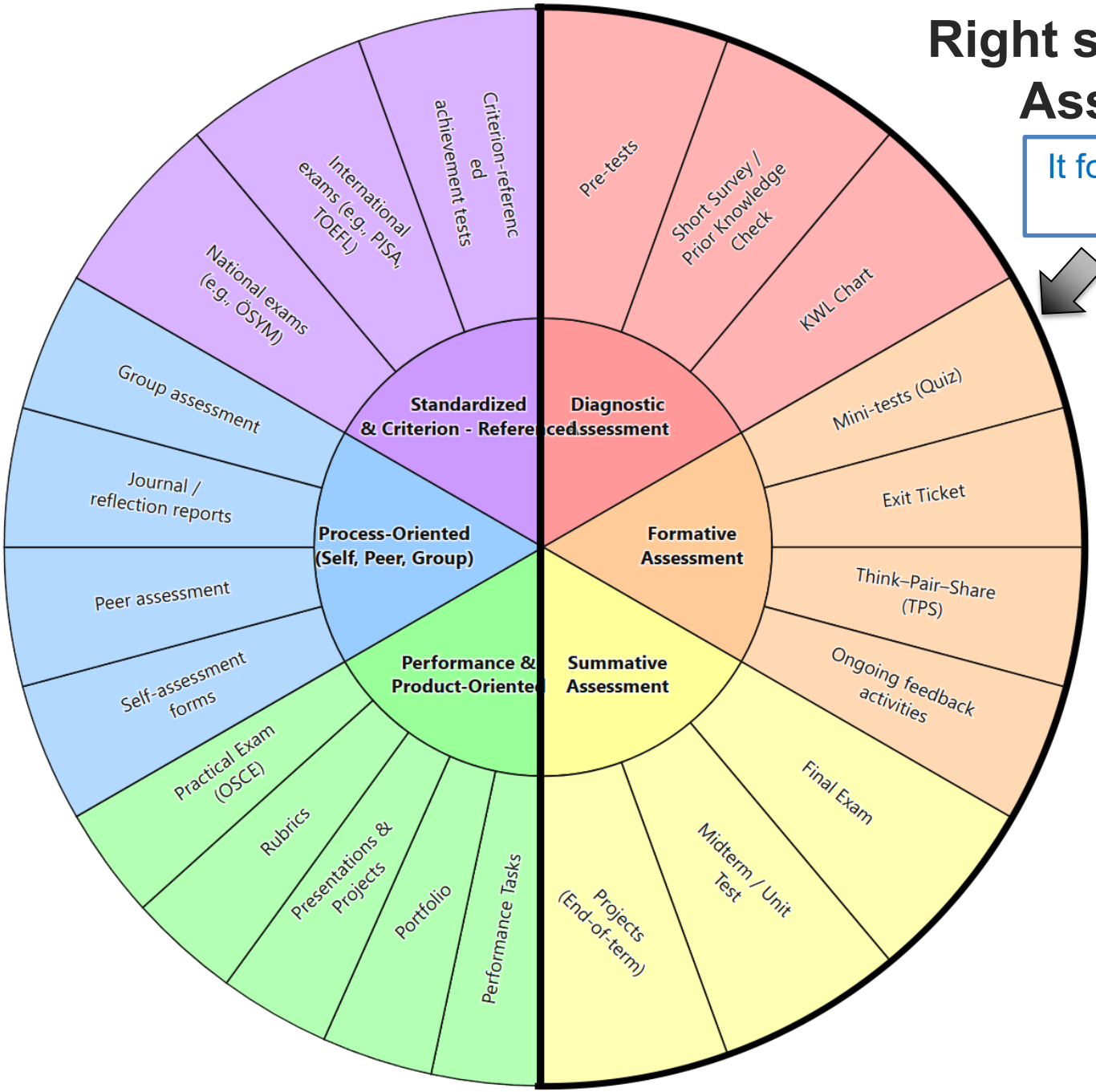
Measurement and Evaluation Tools: Pie Chart



Outer Circle:Tools

Right side: Types of Assessment

It focuses on the “when” of evaluation.



We explained this trio on slide 12.

Left side: Evaluation Approaches

It focuses on what the evaluation addresses and how.

Left side: Evaluation Approaches

- **Purple Section:** Evaluating different groups within a comparable and measurable framework.
- **Blue Section:** Approaches that make the student's active participation in the learning process visible. Focuses more on the quality of the process rather than the outcome.
- **Green Section:** Purpose: To observe the competence of applying knowledge + skills in real life. Here we expect a tangible product from the student.

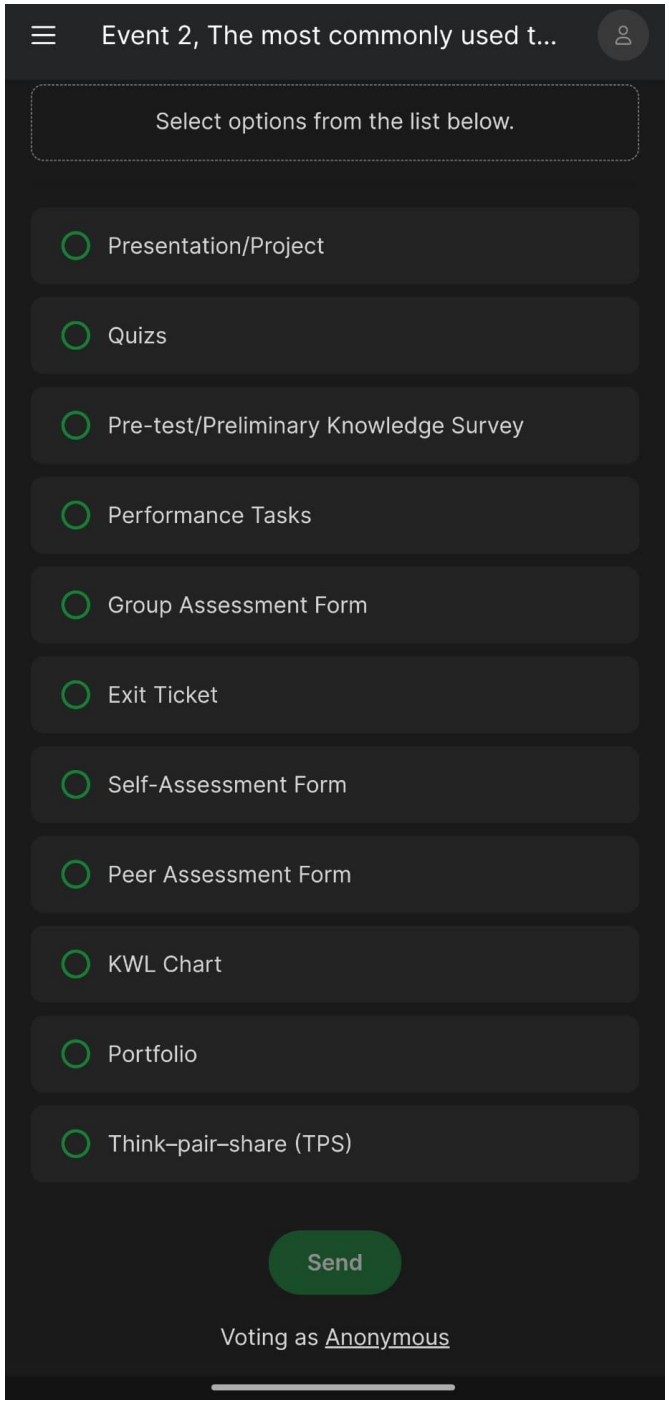
Measurement and Evaluation Tools: Pie Chart

- Thus, the pie chart holistically shows both when we conduct the evaluation and what we evaluate.

ACTIVITY-2

- Our aim is to see which tools/methods you use the most in assessment and evaluation.
- From the list on the screen, please select the ones you use the most.
- You can select as many items as you want, there is no limit.
- Order matters: Choose from the most used to the least used.
- Press the **Send** button.
- To participate, scan the QR code.

ACTIVITY-2


Event 2, The most commonly used t...
Select options from the list below.
Presentation/Project
Quizs
Pre-test/Preliminary Knowledge Survey
Performance Tasks
Group Assessment Form
Exit Ticket
Self-Assessment Form
Peer Assessment Form
KWL Chart
Portfolio
Think–pair–share (TPS)
Send
Voting as Anonymous

A sample Slido Ranking Acticity

Practical Application Scenarios

Examples of Assessment and Evaluation by Discipline:

- **Engineering:** Project, codes, and automatic testing*
- **Medicine:** OSCE stations, structured observation forms
- **Law:** Case analysis reports
- **Language Teaching:** Digital e-portfolio and oral performance assessment with audio/video

Examples from you? → **ACTIVITY-3**

*Automatic testing: An example from software. Outputs are compared with expected results. Instead of manually checking one by one, the evaluation process is performed automatically by the software.

ACTIVITY-3

- Instructions will be provided as handouts.
  You may use the Pie Chart material and Appendices (Appendix-1, Appendix-2 – handout).
- **Main Question:**
  If you wanted to try a new method in your course next semester, which one would you choose?
- Prepare in groups and respond via **Padlet**.
  Link: ibrahimkaya.com.tr/c1 (Click on your group's link)

Examples of Assessment and Evaluation by Discipline

- Examples of practices at undergraduate and graduate level in engineering and agriculture faculties around the world.

  - Details are provided in Appendix-3 (Slide 46).

Appendix-3 Preview

Measurement and Evaluation Application Examples from Around the World

A) Engineering Departments

UNDERGRADUATE LEVEL

USA – MIT / Stanford / UC Berkeley

- Automatic Code Evaluation (Autograder): Test scenarios connected with unit tests, instant feedback, rubrics + version control (GitHub Classroom) .
- Capstone Projects: Real company/research problems, Search report + demo + final delivery triple, peer evaluation + customer score.
- Lab Practices: Pre-lab quiz, lab notebook, video-recorded display and rubric performance scoring.

Sources : MIT OpenCourseWare – Assessment in Engineering Education
https://ocw.mit.edu
https://engineering.berkeley.edu/
https://cs61a.org/
https://ocw.mit.edu/courses/6-0001-introduction-to-computer-science-and-programming-in-python-fall-2016/

United Kingdom – Imperial College London / UCL

- CDIO based (Conceive–Design–Implement–Operate) set projects, design journal, design review sessions, poster + oral defense.
- Open-ended problem clusters andstructural with rubrics formative feedback.

Sources : CDIO Official site http://www.cdio.org/
https://en.wikipedia.org/wiki/CDIO_Initiative
https://www.imperial.ac.uk/electrical-engineering/study/current-students-course-handbook/msc-individual-research-project/

Germany – Technical University of Munich (TUM) / RWTH Aachen University

- Model-based design And HIL (Hardware-in-the-Loop) evaluation, Two rater application for reliability.
- Case study + short report (short memorandum) in engineering economics courses .

Sources: TUM Engineering Education Research → https://www.ed.tum.de/en/cer/
https://www.mathworks.com/company/user_stories/technische-universitat-munich-uses-model-based-design-to-drive-research-problem-based-learning-and-industry-collaboration.html
https://www.cee.ed.tum.de/en/era/software/reliability/
https://studylib.net/doc/25895679/case-studies-in-engineering-economics-for-manufacturing-c
https://www.rwth-aachen.de/cms/root/studium/vor-dem-studium/studiengaenge/liste-aktuelle-studiengaenge/studiengangbeschreibung/~bisi/wirtschaftsingenieurwesen-b-sc-

3. Technology Integration

Why Technology Integration?

- **Accessibility:** Opportunity to reach students from anywhere.
- **Engagement:** Interactive tools increase student motivation.
- **Instant Feedback:** Immediate opportunities for results and analysis.
- **Data Tracking:** Measuring and monitoring the learning process.
- **Diversity:** Innovative tools. Methods suitable for different learning styles.

Appendix-4 Assessment and Evaluation Tools (Updated 27.08.2025, Enhanced)

In Appendix-4, you can access the full list and details of a total of 44 tools across 6 main categories.

- Details are provided in Appendix-4 (Slide 46).

Technology Based Measurement and Evaluation Tools (44 Tools, Updated August 2025)

Prepared by: Lecturer İbrahim KAYA (SBTÜ UZEM)

🔰: AI-Powered Tools

🏫: School/institution-specific license

Category	Vehicle / System	Pricing (Terms of Use)	Features and Notes	Links
1. Feedback Methods	Kahoot!	Freemium (Free basic, advanced features are paid)	A gamified multiple-choice quiz tool. Students participate via phone or PC, and questions are displayed on the classroom screen. Instant scoring and rankings create a sense of competition. Research has shown that using Kahoot significantly increases student motivation and retention. Ideal for large groups. **Alternative:** Wayground (Quizizz).	https://kahoot.com https://wayground.com/
	Mentimeter	Freemium (Basic version is free)	It offers activities like live polls, word clouds, and open-ended questions. It can be integrated into presentations. Student responses are displayed graphically in real time. It's especially useful for adding an interactive element to a lesson and gathering feedback.	https://www.mentimeter.com
	Socrative	Freemium (Teacher account is free, Pro version is paid)	Real-time quizzes, tests, and exit tickets. Provides instant tracking of student progress. Question types: multiple choice, true-false, short answer. Effective for small and medium-sized classes; results can be downloaded as Excel/PDF.	https://www.socrative.com
	Poll Everywhere	Freemium (Free up to a certain user/response limit)	A survey and voting tool that can be integrated into slides. Students can participate via web or SMS. It instantly projects responses as graphics or text. It's also used by conferences and large classes, increasing participant engagement.	https://www.polleverywhere.com
	Eduflow	Freemium (Limited free class)	It's a platform that allows students to anonymously evaluate each other's assignments or projects. As an instructor, you assign an assignment, and the system randomly pairs students and asks them to comment on	https://www.eduflow.com

Appendix-4 Preview

Assessment and Evaluation Tools (AI-Enhanced)
(Updated 27.08.2025)

- Here, we will present only a few examples.
- The complete list is provided as a file in Appendix-4.

- Subheadings :

1. Feedback Methods
2. Performance Assessment Tools
3. Exam and Test Management
4. Database- and Technical Analysis Tools
5. Product- and Content-Oriented Assessment Tools
6. Adaptive Testing Systems

Measurement and Evaluation Tools

Quizizz	basic version is Free	• Gamified multiple-choice quiz tool. • Students join via phone or PC; questions appear on the classroom screen. • Creates a sense of competition through instant scoring and ranking. • Research shows Quizizz significantly increases student motivation and retention. • Alternative: Kahoot!	wayground.com

Measurement and Evaluation Tools

	Slido	basic version is Free	• Offers live polls, word clouds, open-ended questions, and similar activities. • Can be embedded into presentations. • Student answers are displayed in real time as graphs. • Especially useful for adding interactive elements to lessons or gathering feedback. • **Alternative:** Mentimeter	Slido.com mentimeter.com

Measurement and Evaluation Tools

Another example:

Websites where you can create puzzles. There are also ready-made templates. **Wordmint** and **Wordwall** are two of them.

https://wordmint.com

WordMint

https://wordwall.net

Wordwall

- Alternatives:

  https://puzzle-maker.com/

  https://slidesgo.com

  https://puzzel.org

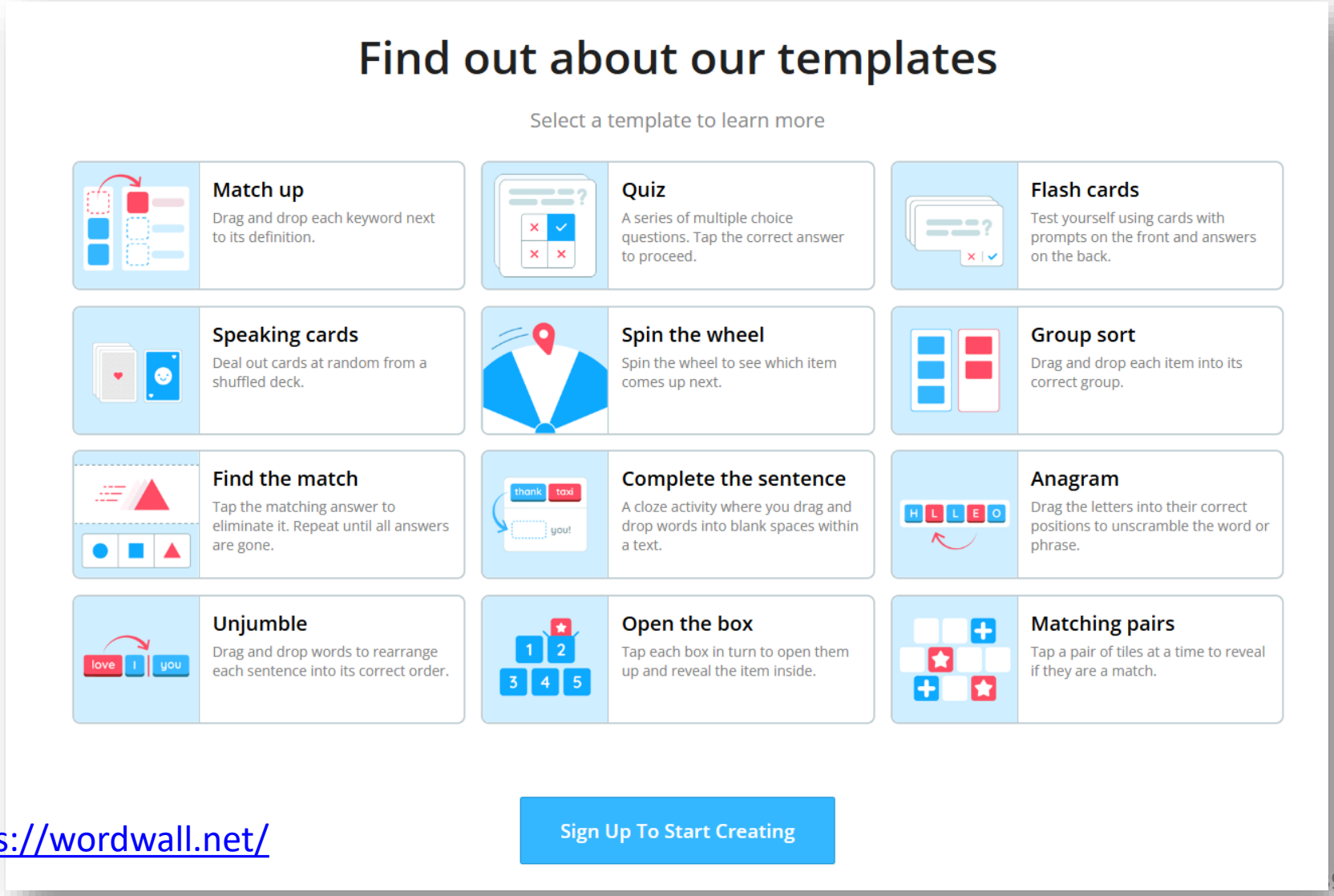
  https://crosswordlabs.com/

  https://learningapps.org/

  https://interacty.me/template-gallery/tags/crossword

  https://www.slidescarnival.com/tag/puzzle

Measurement and Evaluation Tools



https://wordwall.net/

Measurement and Evaluation Tools

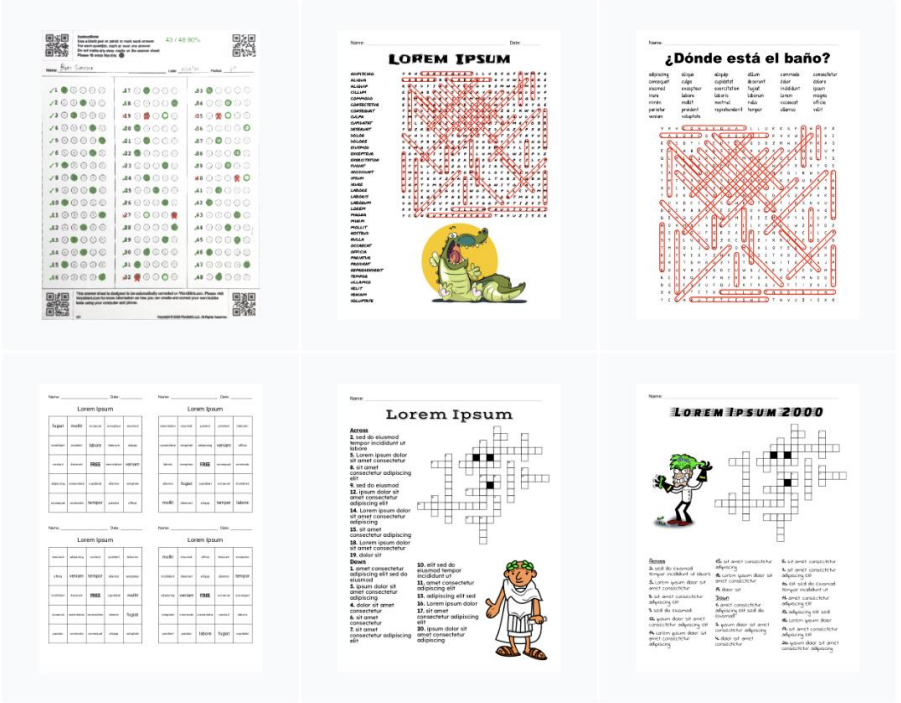
Get started | Sign In

Used by the world's smartest teachers

Teachers who use WordMint create beautiful, engaging classroom materials in a fraction of the time. Use the crossword maker to create a fun alternative to the usual quizzes.

Automatically correct our bubble tests using your phone. Save hours of grading time!

Get Started

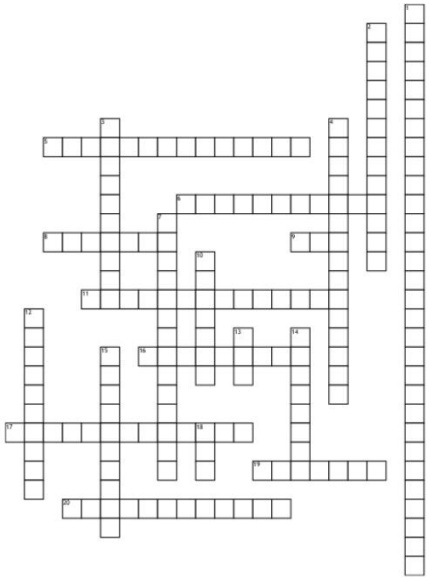


https://wordmint.com

Measurement and Evaluation Tools

Name: _____

Computer Engineering



Across

5. Connects memory (hard drives) to the motherboard.

6. The main printed circuit board

8. One way communication. Only 1 side can send data.

9. Electrical Magnetic Interference.

11. Allow expansion cards to be inserted onto the motherboard.

16. Serves AC power to PSU

17. storage device that uses laser light or electromagnetic waves as part of the process of reading or writing data

19. Connection between computers that allows users to send data to one another from long distances.

20. Allowed connection from computer to printer in the past

Down

1. Installed by the OS to access and communicate with each hardware component.

2. Used to clean dust from computer.

3. Both sides can send data, but only one at a time.

4. System software that enables the computer hardware to communicate and operate with the application software.

7. Increase the functionality of a computer by adding controllers for specific devices.

10. A pair of chips on the motherboard

12. Both sides can send data, at the same time.

13. Graphics Processing Unit

14. Allows computer to connect to network through a wire.

15. Previously used for peripherals such as a mouse or a modem

18. Connects computer to monitor for display.

Computer Engineering Crossword

The main printed circuit board

A pair of chips on the motherboard

Show More...

Customize

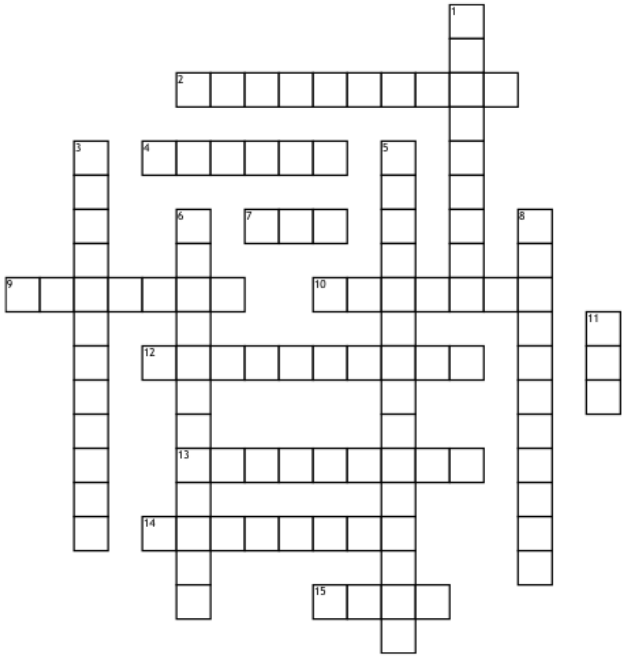
Add, edit, delete clues, and customize this puzzle. Print copies for an entire class.

Print / Download

https://wordmint.com

Name: _____ Date: _____

Digital Technology



Across

2. external device that provides input and output for the computer (e.g. keyboard, mouse)

4. data sent to your computer by a Web server that records your actions on a certain Web site

7. memory containing hardwired instructions that the computer uses when it boots up, before the system software loads

9. hardware or software that acts as a bridge between two networks so that data can be transferred between a number of computers

10. each motherboard has a collection of chips and controllers known as _____

12. rate at which a processor can complete a processing cycle

13. prevent data from being modified or tampered with

14. separate two or more parts of a network to control data exchange between each other

15. protocol used for sending e-mail over the Internet using a set of commands that authenticate and direct the transfer of electronic mail

Down

1. code made up of numbers separated by three dots that identifies a particular computer on the Internet

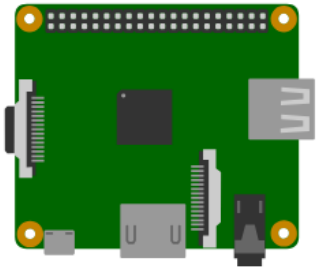
3. process of converting data into a secret code for transmission over a public network

5. keep information protected from unauthorized disclosure or viewing

6. computer resources must be ready for use by authorized users when needed

8. main circuit board of your computer and is also known as the mainboard or logic board

11. computer network limited to a small area such as an office building, university, or even a residential home



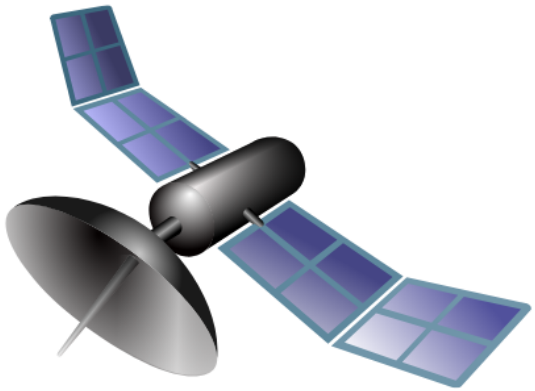
https://wordmint.com

Name: _____ Date: _____

Technology Terms*

B J B I O P L L D W P Y X A G E S O F T W A R E
R O G H Q U N Z E J K V K L Q Z W M T P F R U E
H Z X S B P B S F T W K F E U E K Y S Z W I H D
H Y A Q G C N O B U P G R A D E P N L P H T X T
I L R H K B J Y E S U O M X G H G N H S F V K R
X E V I R D D R A H C Q V L N O I T C N U F A O
R G T P R I N T E R I S R E D L O F M P D D Z S
Y H Q O P C U W P T S H U T D O W N O V M B T S
T D S I S N Z Q T Q B P U Q I X Y H U T Z T U E
P I A Q B O O T U P Y S S K Q C T A S Z J R D C
B P F V C U V X C N V X X Y K S T V E I M O O O
E P V D A E R M O T H E R B O A R D P F N P R R
M E M O R Y L A Y W K Z S E L I F O A U W B F P
W F J V E V T P X F E M O Y D L M Q D Q A S J X
T B E N J U D R A O B Y E K B J A S Z Y I U T X
G R A P H I C S D E Z Z N I T L G M V D C F D H
I O G E G Z R K G R Q W K T O J Q O K N O E D A
M O N I T O R O H A C C O M P U T E R I N K V V
P P D J J D E I D W T S K Q M V K R H G S S P D
O K L V J U S Q C D X U P C S N X O S O P G H Y
B G P H D Q E R I R G U W V C B R A W L U N O Z
E J H L F M X L T A N X H Y N O Z W J Q B F J F
X S H G H B L G R H N O I T A C I L P P A P D A
N L J U P S T U C T R O H S D T U Y T L N L N Y

APPLICATION
MOTHERBOARD
HARD DRIVE
MOUSE PAD
PROCESSOR
SHORTCUTS
SHUT DOWN
COMPUTER
FUNCTION
GRAPHICS
HARDWARE
KEYBOARD
SOFTWARE
USB PORT
BOOT UP
FOLDERS
MONITOR
PRINTER
UPGRADE
LOG IN
MEMORY
FILES
ICONS
MOUSE
CPU



https://wordmint.com

Name: _____ Date: _____

Computer Terms

Across

3. The primary computer storage device, which spins, reads and writes one or more fixed disk platters.

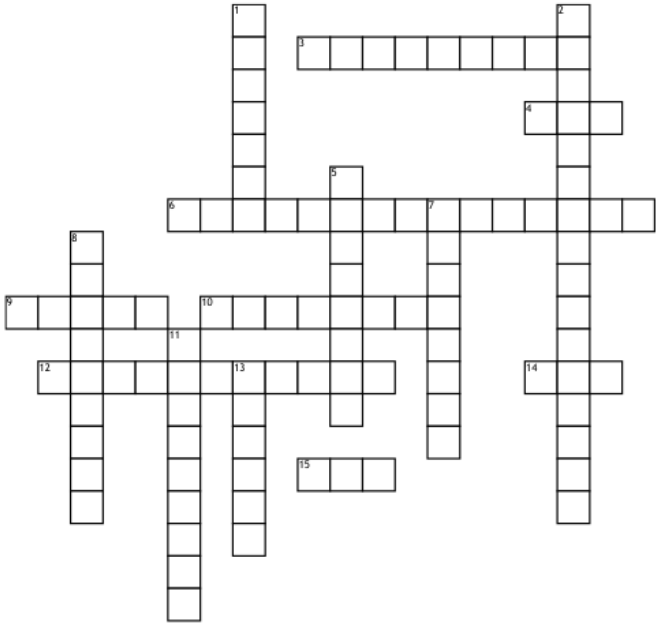
4. Universal Serial Bus

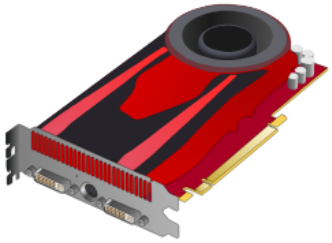
6. is the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills

9. a device or program that enables a computer to transmit data over

10. is a generic term for organized collections of computer data and instructions

12. one of the most essential parts of a computer system.





14. A central processing unit

15. Short for digital versatile disc or digital video disc

Down

1. providing a common topic identifier in text and chat messages so they can be searched as a group. Commonly used in tweets

2. a computer designed for use by one person at a time.

5. is the collection of physical parts of a computer system.

7. The global communication network that allows almost all computers worldwide to connect and exchange information.

8. connects to the motherboard of a computer system and generates output images to display.

11. a widely used sans-serif typeface developed in 1957 by Swiss typeface designer Max Miedinger

13. refers to the copying and archiving of computer data so it may be used to restore the original after a data loss event.

https://wordmint.com

ACTIVITY-4

- In this part, we will have a short quiz.
  - Scan the QR code (will appear on the screen) or go to joinmyquiz.com on your PC.
  - The login code or QR will be shared shortly.

Sources

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Appendices

- **Material Link:**

Measurement and Evaluation Tools:Pie Chart

- Presentation + All Appendices Together:

Google Drive Link

Closing - Q&A

- Before closing, we will have a survey for you to fill out. QR code:

- After the survey, let's move on to the Q&A part.

Thank you for your participation.