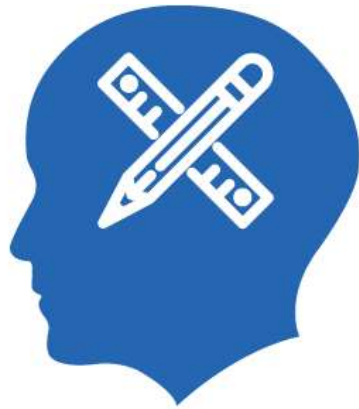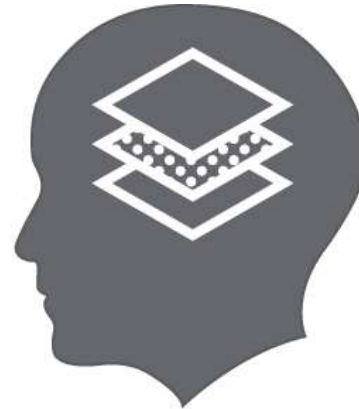# E-Learning with Bloom's Taxonomy
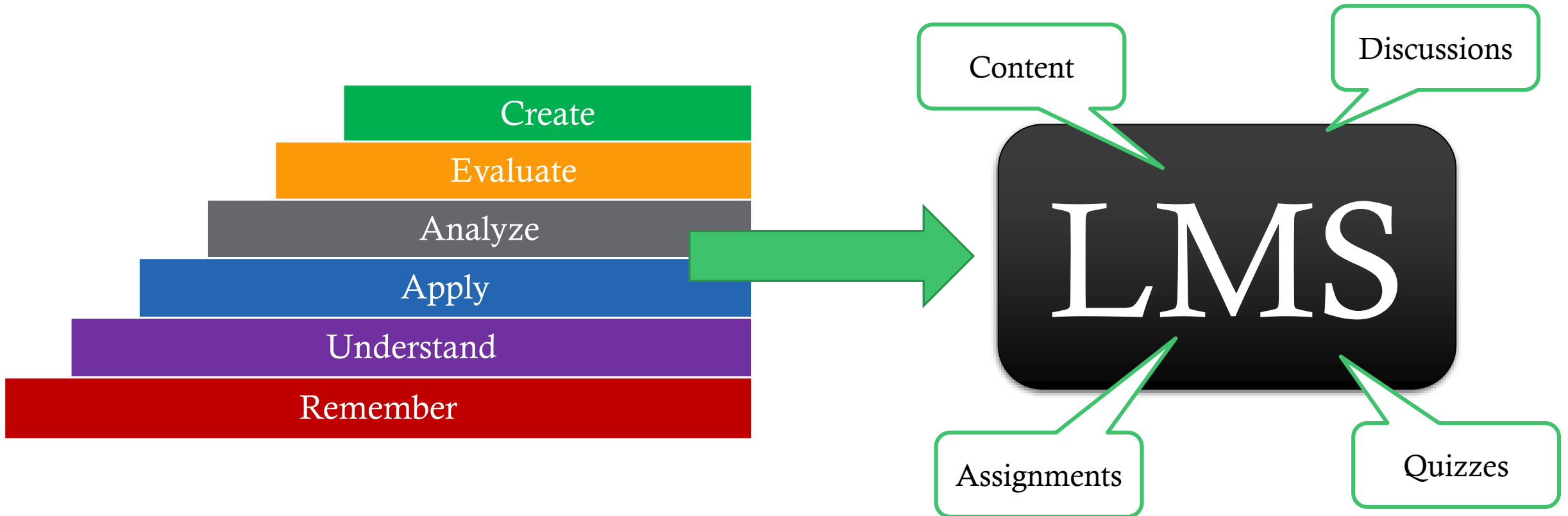

Moving Online Instruction into the Higher Orders of Thinking

Jason Johnston – Instructional Designer www.higherelearning.com

College of Social Work – University of Kentucky https://socialwork.uky.edu

Benjamin Bloom Ph.D

1913-1999

Ph.D in Education who made significant contributions to the classification of educational objectives and researching mastery.

Main Contribution:

Bloom, Benjamin S. *Taxonomy of Educational Objectives* (1956). Published by Allyn and Bacon, Boston, MA. Copyright (c) 1984 by Pearson Education.

Benjamin Bloom Ph.D

1913-1999

After forty years of intensive research on school learning in the United States as well as abroad, my major conclusion is: What any person in the world can learn, almost all persons can learn if provided with appropriate prior and current conditions of learning.

As quoted in Dweck, C. (2006). *Mindset: The new psychology of success*. Random House.
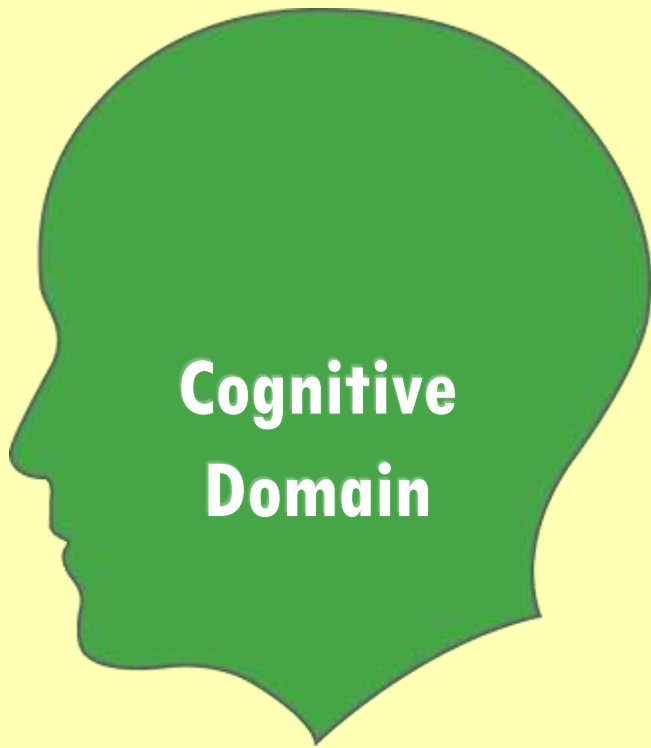
Cognitive Domain

Head

Knowing

Mental Skills

Knowledge

Psychomotor Domain

Hand

Doing

Manual Skills

Skills

Affective Domain

Heart

Feeling

Emotional Growth

Attitude
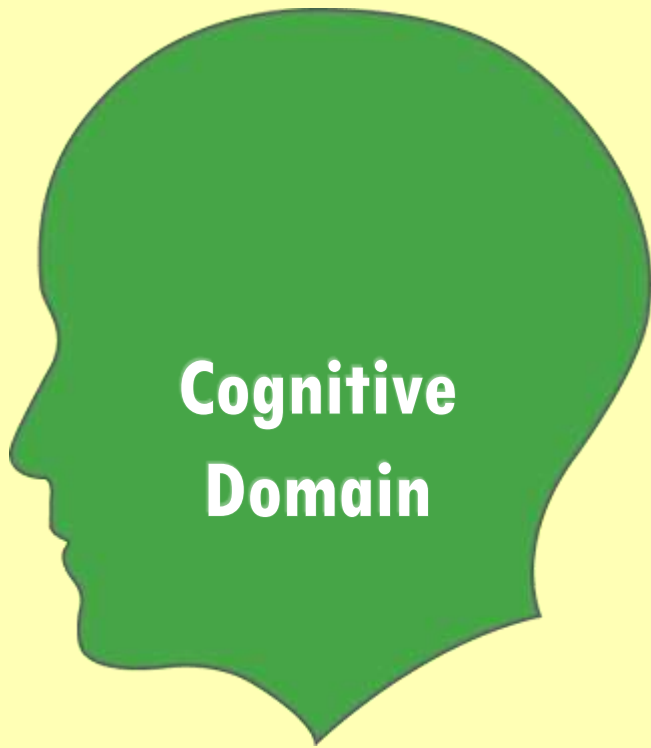
Bloom (1956)

Cognitive Domain

Head

Knowing

Mental Skills

Knowledge
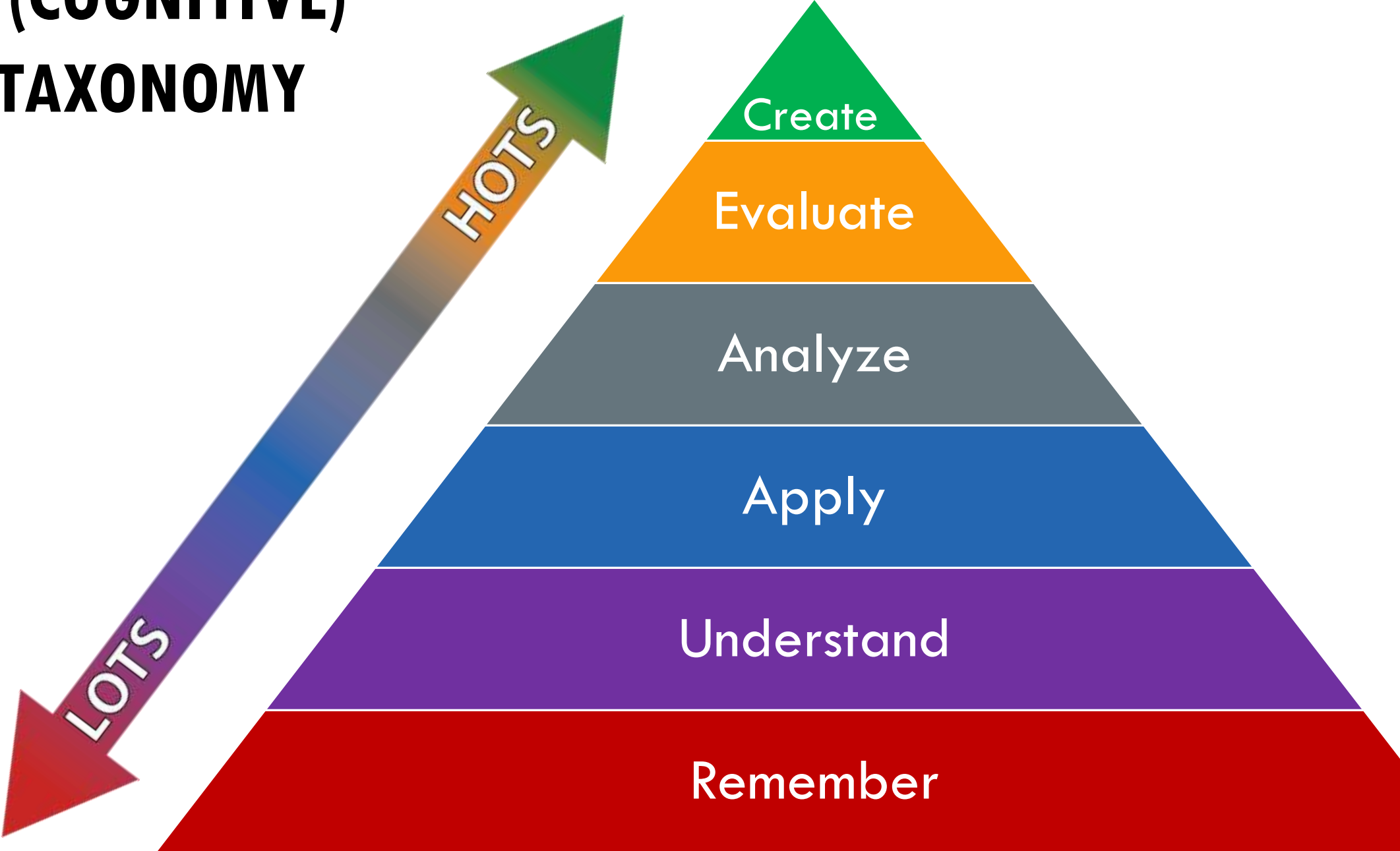
Bloom (1956)

BLOOM'S (COGNITIVE) REVISED TAXONOMY

Bloom (1964)

Krathwohl (2002)

Remember

BLOOM'S (COGNITIVE) REVISED TAXONOMY
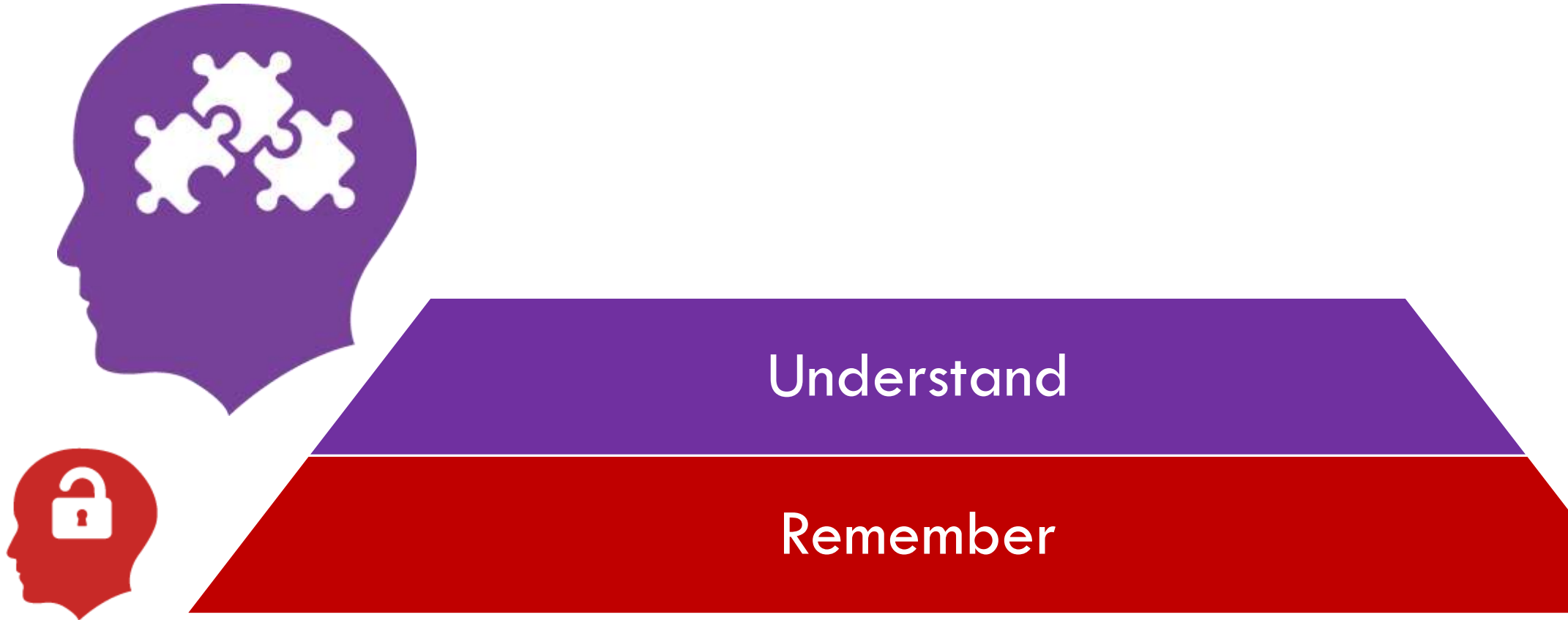
Bloom (1964)
Krathwohl (2002)

Understand

Remember

BLOOM'S (COGNITIVE) REVISED TAXONOMY

Bloom (1964)
Krathwohl (2002)

Evaluate

Analyze

Apply

Understand

Remember
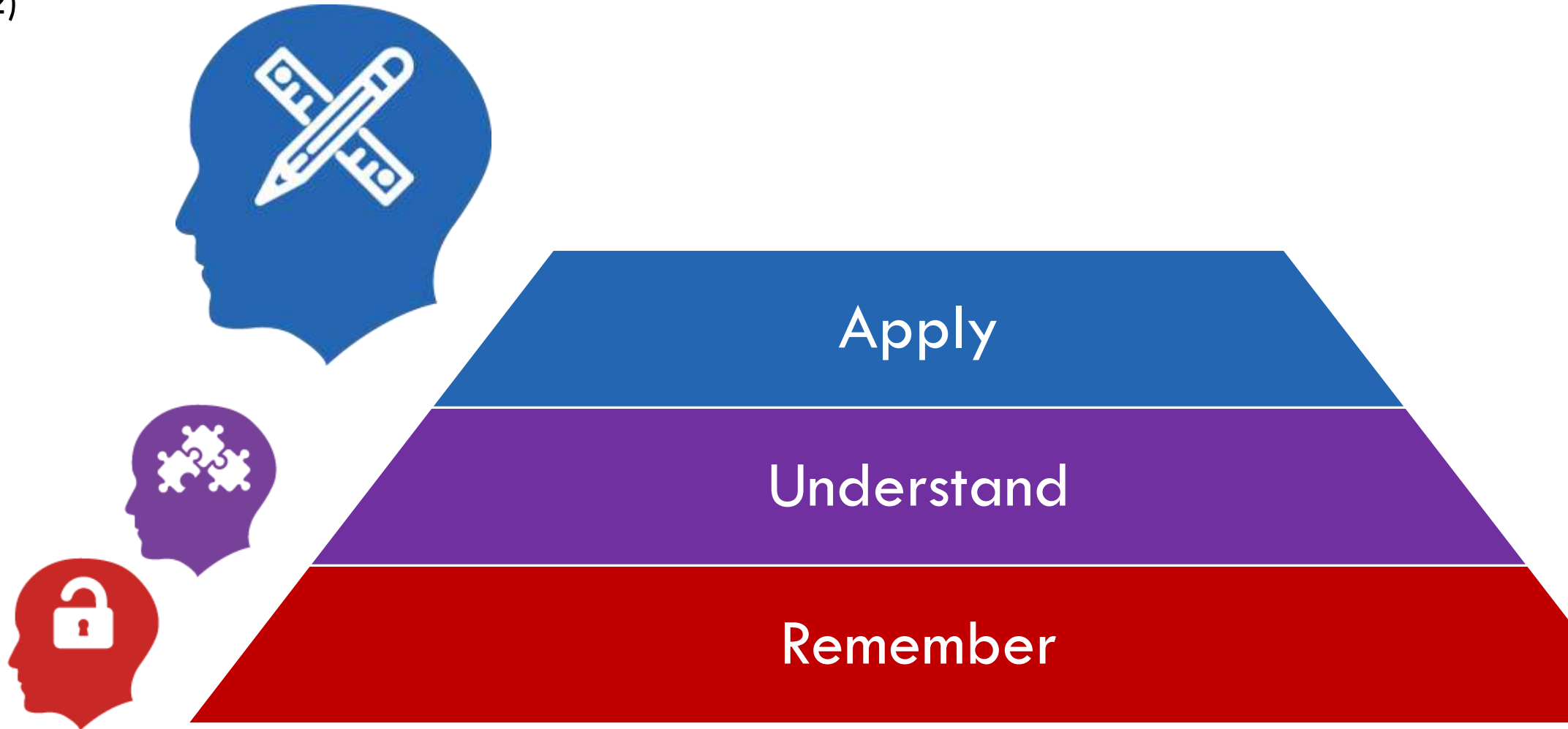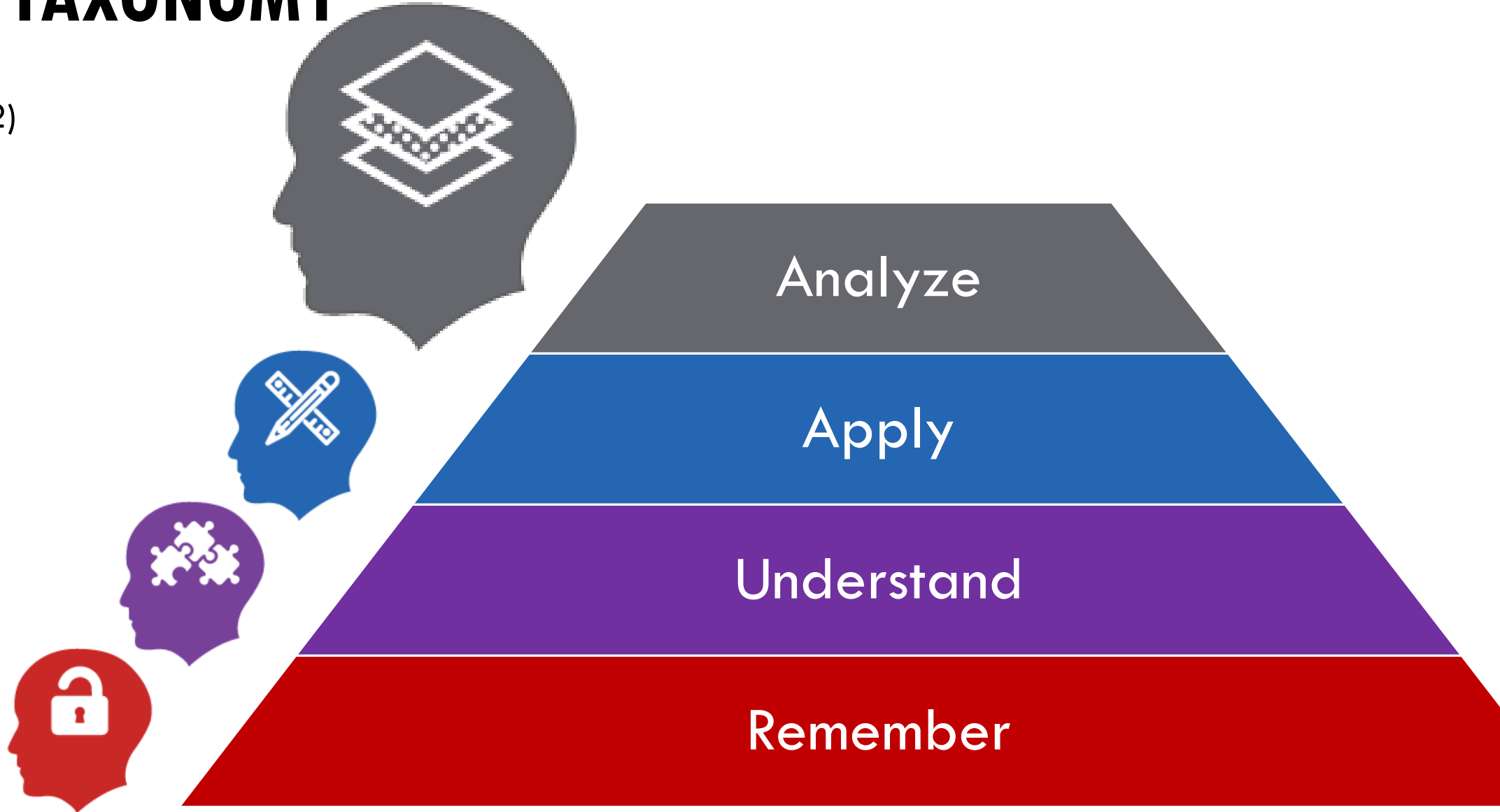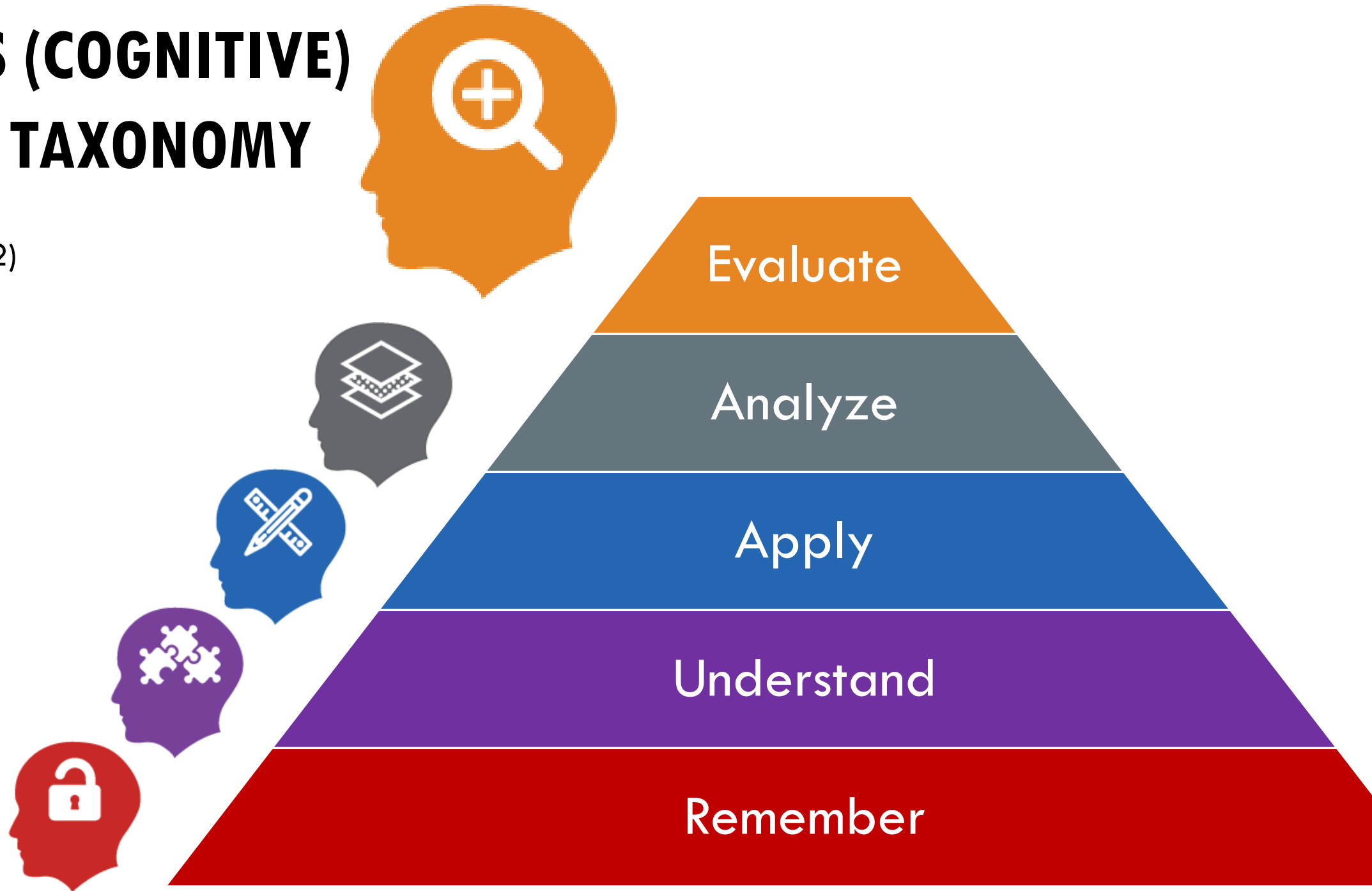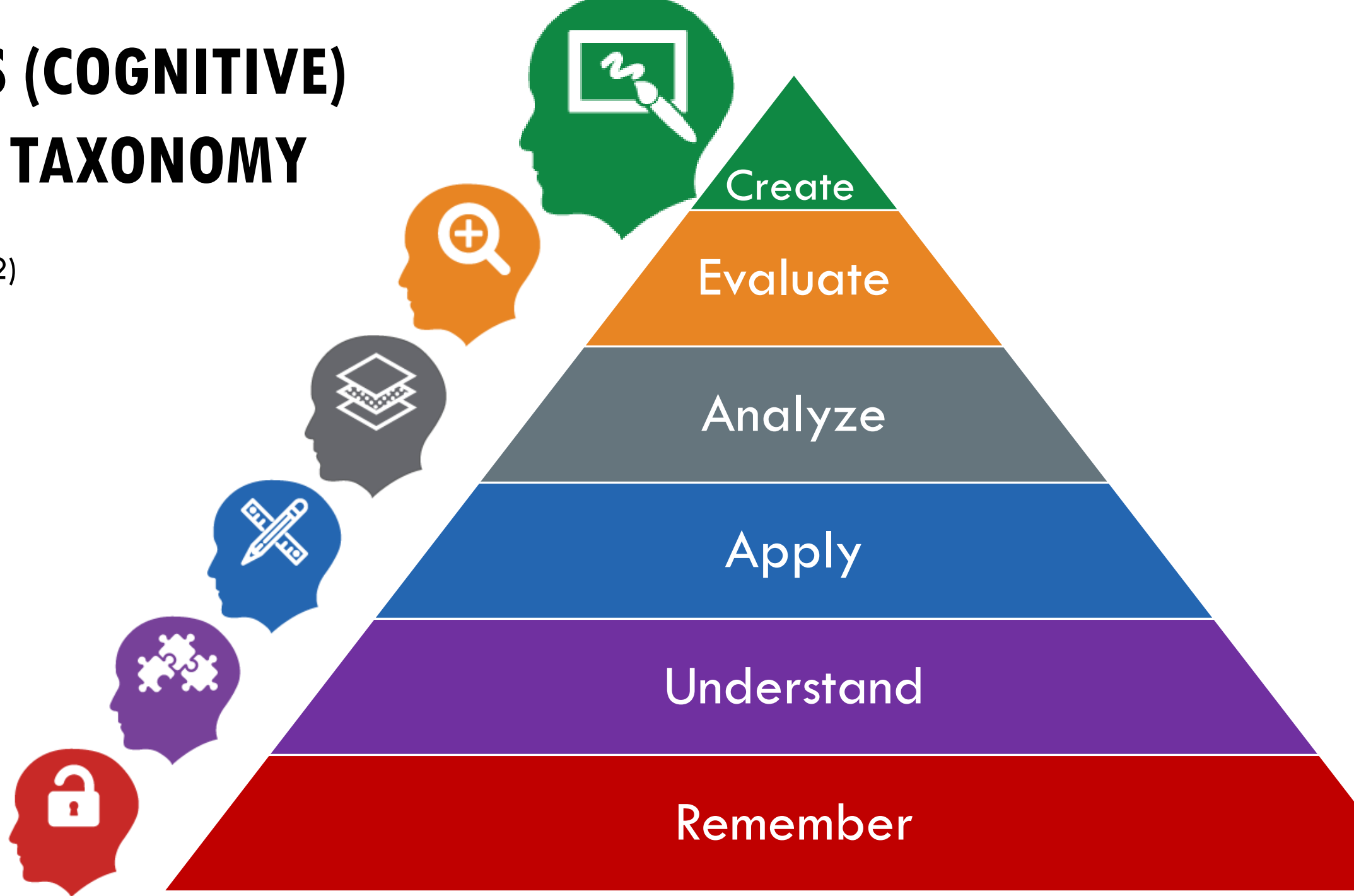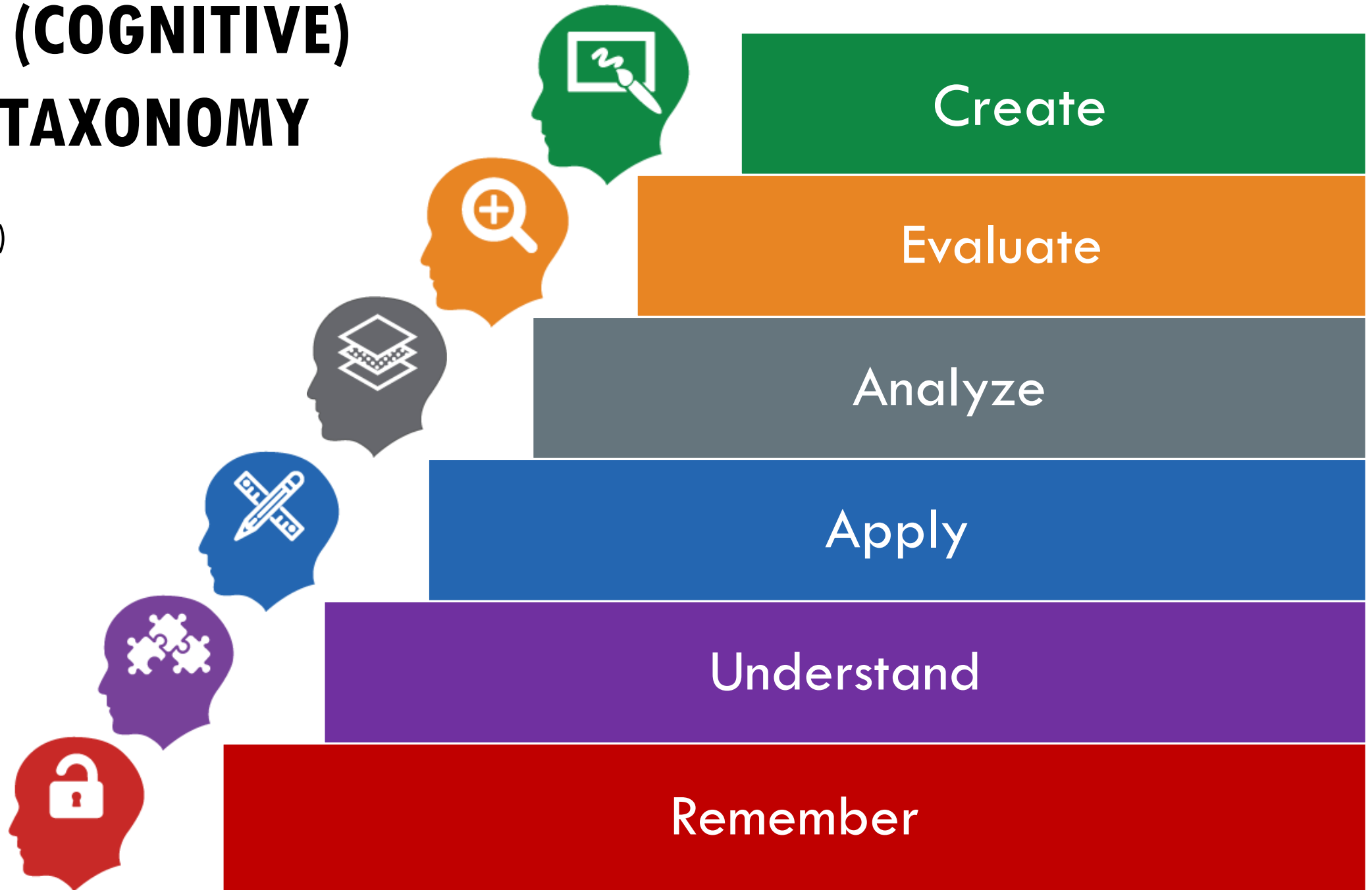
Why Use Bloom's Taxonomy?

Prepare students for a successful, working future
(Bagarukayo, et al, 2012)

Plan curriculum / identify gaps in learning (Krathwohl, 2002)

Scales from the easier to more difficult skills for scaffolding

E-LEARNING
WITH BLOOM'S

E-Learning with Bloom's Taxonomy

Content

Discussions

Assignments

Quizzes
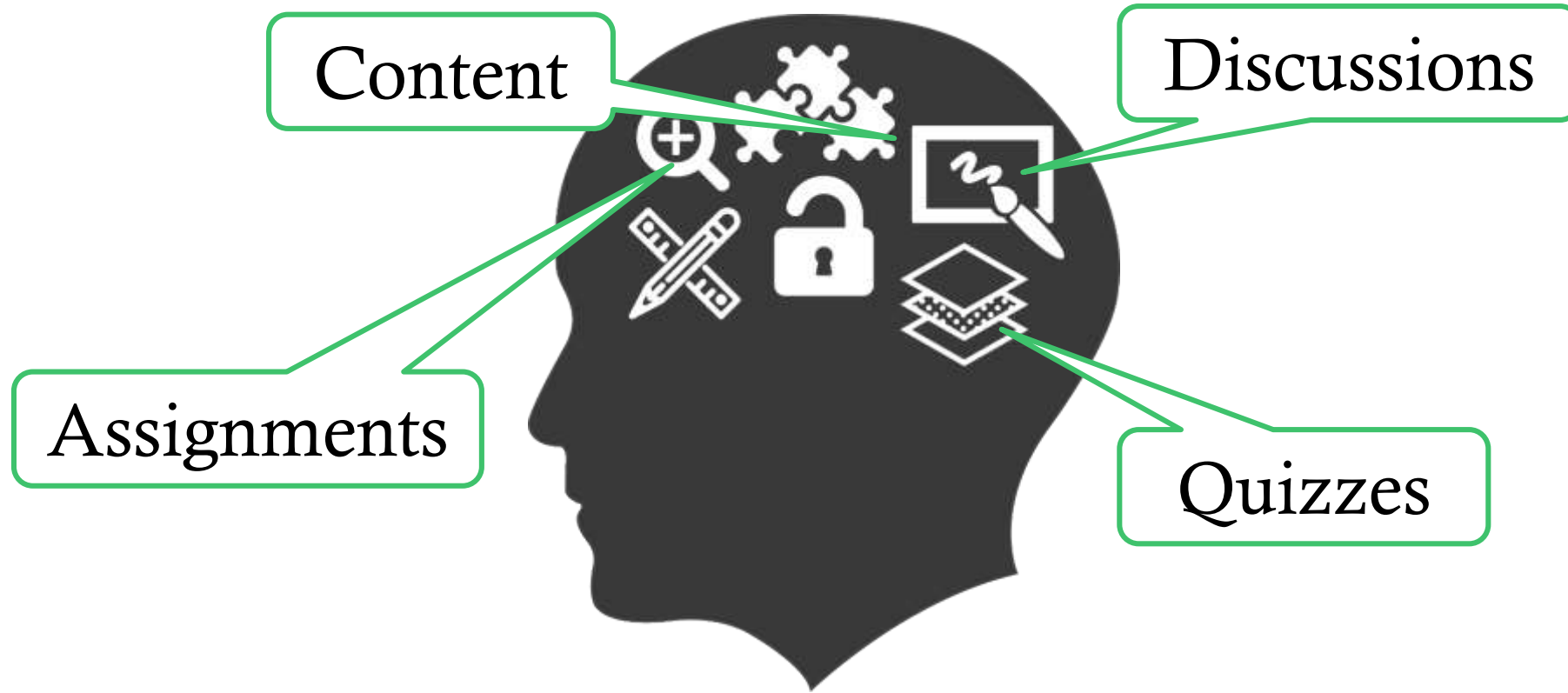
REVIEW THE HANDOUTS

Bloom's Taxonomy Question Stems

Remembering
- Make a story map showing the main events of the story
- Make a time line of your typical day
- Make a concept map of the topic
- Write a list of keywords you know about...
- What characters were in the story?
- Make a chart showing...
- Make an acrostic poem about...
- Recite a poem you have learned

Questions for Remembering
- What happened after...?
- How many...?
- What is...?
- Who was it that...?
- Name the ...?
- Find the definition of...
- Describe what happened after...
- Who spoke to...?
- Which is true or false...?

REMEMBER Retrieving relevant knowledge from long term memory

Understanding
- Write in your own words.
- Cut out, or draw pictures to illustrate a particular event in the story.
- Report to the class...
- Illustrate what you think the main idea may have been.
- Make a cartoon strip showing the sequence of events in the story.
- Write and perform a play based on the story.
- Write a brief outline to explain this story to someone else
- Explain why the character solved the problem in this particular way
- Write a summary report of the event.
- Prepare a flow chart to illustrate the sequence of events.
- Paraphrase this chapter in the book.
- Retell in your own words.
- Outline the main points.

Questions for Understanding
- Can you explain why ...?
- Can you write in your own words?
- How would you explain...?
- Can you think could have happened next...?
- What do you think...?
- Who do you think...?
- What was the main idea...?
- Can you clarify...?
- Can you illustrate...?
- Does everyone act in the way that ...... does?

UNDERSTAND Determining the meaning of instructional messages

Applying
- Construct a model to demonstrate how it looks or works
- Practise a play and perform it for the class
- Make a diorama to illustrate an event
- Write a diary entry
- Make a scrapbook about the area of study.
- Prepare invitations for a character's birthday party
- Make a topographic map
- Take and display a collection of photographs on a particular topic
- Make up a puzzle or a game about the topic.
- Write an explanation about this topic for others.
- Dress a doll in national costume.
- Make a clay model.
- Paint a mural using the same materials.
- Continue the story...

Questions for Applying
- Do you know of another instance where...?
- Can you group by characteristics such as...?
- Which factors would you change if...?
- What questions would you ask of...?
- From the information given, can you develop a set of instructions about...?
- Which approach would you use to...?

APPLY Carrying out or using a procedure in a given situation

Analyzing
- Use a Venn Diagram to show how two topics are the same and different
- Design a questionnaire to gather information
- Survey classmates to find out what they think. Analyse the results.
- Make a flow chart to show the critical stages.
- Classify the actions of the characters in the book / role play
- Construct a graph to illustrate selected information.
- Make a family tree showing relationships
- Devise a role play about the study area.
- Write a biography of a person studied.
- Prepare a report about the area of study.
- Conduct an investigation to produce information to support a view.

Questions for Analyzing
- Which events could not have happened?
- If ...happened, what might the ending have been?
- How is ...similar to ...?
- What do you see as other possible outcomes?
- Why did ...changes occur?
- Can you explain what must have happened when...?
- What are some or the problems of...?
- Can you distinguish between...?
- What were some of the motives behind...?
- What was the turning point?
- What was the problem with...?

ANALYZE Breaking material into parts to organize and differentiate

Evaluating
- Write a letter to the editor
- Prepare and conduct a debate
- Prepare a list of criteria to judge...
- Write a persuasive speech arguing for/against...
- Make a booklet about five rules you see as important.
- Convince others.
- Form a panel to discuss viewpoints on...
- Write a letter to... advising on changes needed
- Write a half-yearly report.
- Prepare a case to present your view about...

Questions for Evaluating
- What are the pros and cons of...?
- Is there a better solution to...?
- Judge the value of... What do you think about...?
- Can you defend your position about...?
- Do you think... is a good or bad thing?
- How would you have handled...?
- What changes to...... would you recommend?
- Do you believe...? How would you feel if...?
- How effective are...?
- What are the consequences...?
- What influence will...have on our lives?
- Why is ...of value?
- What are the alternatives?
- Who will gain & who will lose?

EVALUATE Making judgments based on criteria and standards

Creating
- Invent a tool / machine to do a specific task.
- Create a new product. Give it a name and plan a marketing campaign.
- Write a TV show play, puppet show, role play, song or pantomime
- Design a new monetary system
- Develop a menu for a new restaurant using a variety of healthy foods
- Design a record, book or magazine cover for...
- Devise a way to...
- Make up a new language and use it in an example

Questions for Creating
- Can you design a...to...?
- Can you see a possible solution to...?
- If you had access to all resources, how would you deal with...?
- Why don't you devise your own way to...?
- What would happen if...?
- How many ways can you...?
- Can you create new and unusual uses for...?
- Can you develop a proposal which would...?

CREATE Putting elements together to form a novel, coherent whole

CONTENT

Create

Evaluate

Analyze

Apply

Understand

Remember

HOTS

LOTS

DISCUSSIONS

Create

Evaluate

Analyze

Apply

Understand

Remember

HOTS

LOTS

QUIZZES

Create

Evaluate

Analyze

Apply

Understand

Remember

HOTS

LOTS

ASSIGNMENTS

- Invent a Tool
- Role Play
- Outline a TV show
- Design a poster
- Make a Commercial
- Marketing Campaign
- Podcast
- Movie
- Blog
- Wiki
- Story
- Animation
- Slideshow
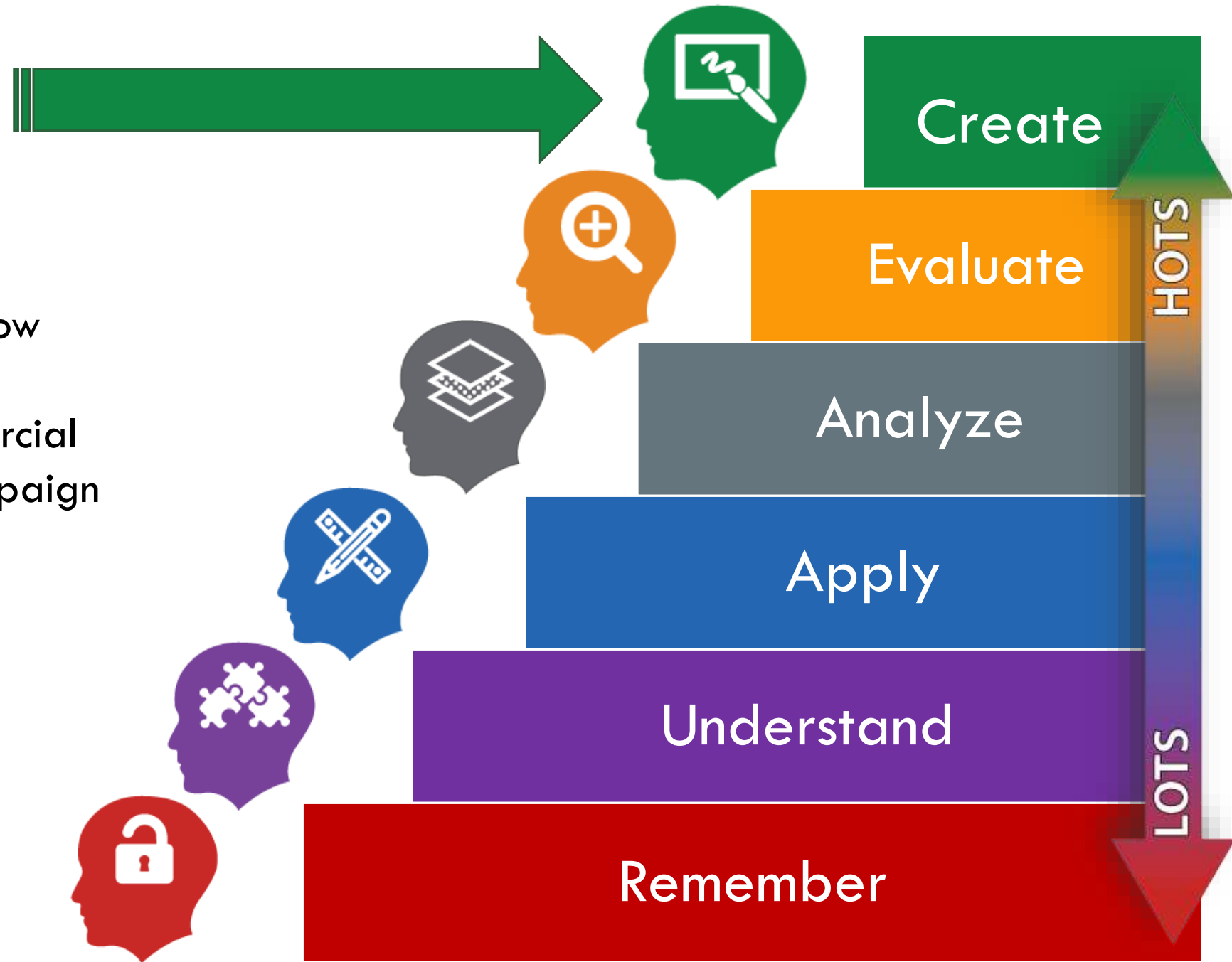
Create

Evaluate

Analyze

Apply

Understand

Remember

HOTS

LOTS

CREATE ONE LEARNING ACTIVITY RIGHT NOW (LIKE A DISCUSSION QUESTION OR ASSIGNMENT) THAT WOULD PROMOTE EITHER EVALUATING OR CREATING.

Bagarukayo, E., Weide, T., & Meijden, H. (2012). An approach to learning by construction. International Journal Of Education & Development Using Information & Communication Technology, 8(3), 43-61. Retrieved from http://ijedict.dec.uwi.edu

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E-Learning with Bloom's Taxonomy
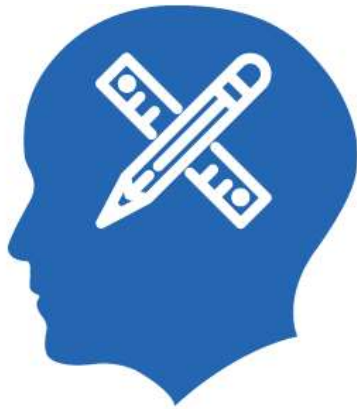
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College of Social Work – University of Kentucky https://socialwork.uky.edu

CHARTS AND RESOURCES

BLOOM'S (COGNITIVE) REVISED TAXONOMY

Bloom (1964)
Krathwohl (2002)

Create
Evaluate
Analyze
Apply
Understand
Remember

BLOOM'S REVISED TAXONOMY

Create

Evaluate

Analyze

Apply

Understand

Remember

HOTS

LOTS

Bloom (1964)

Krathwohl (2002)

← LOW LEVEL THINKING SKILLS →→ HIGH LEVEL THINKING SKILLS →
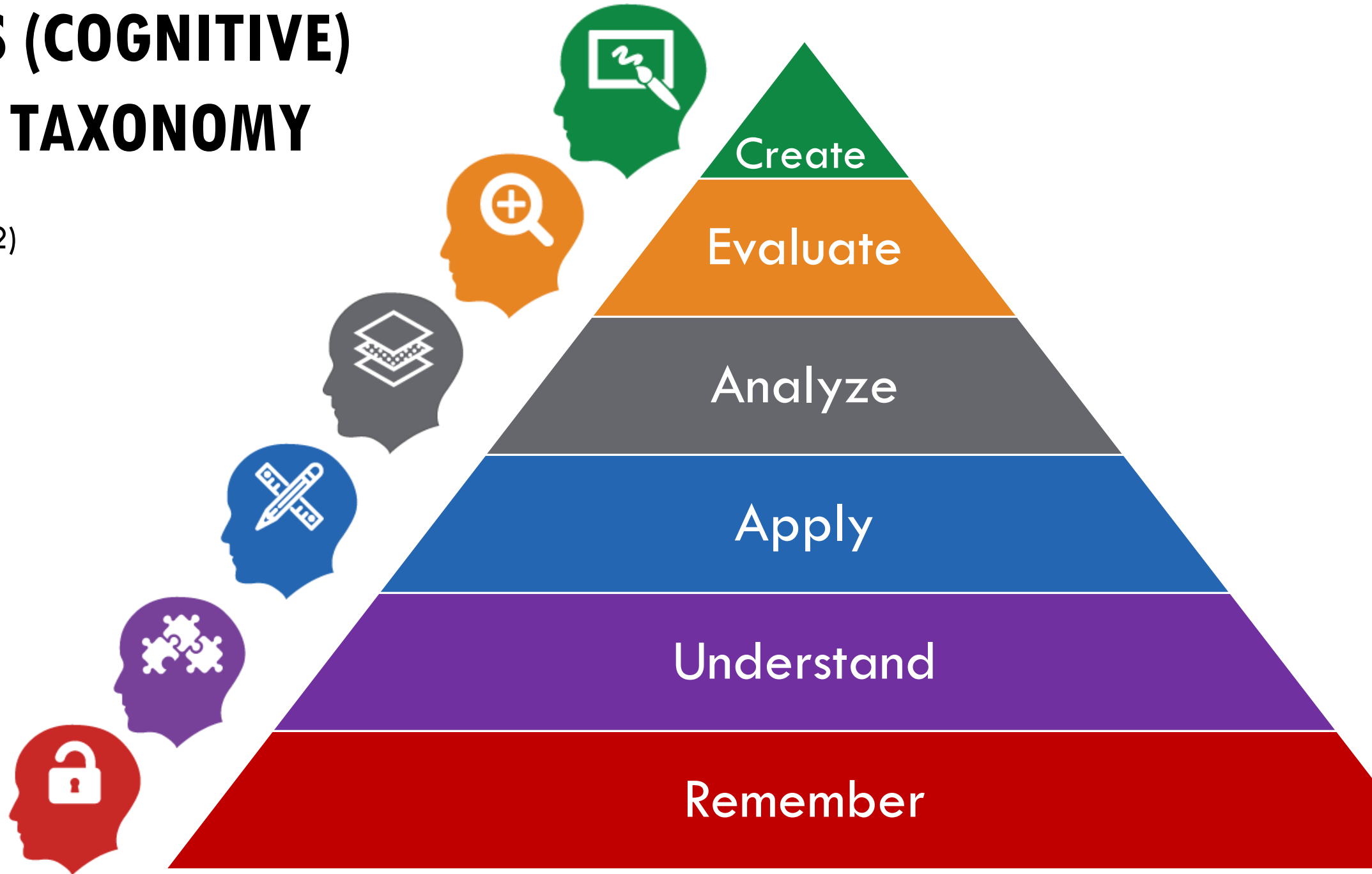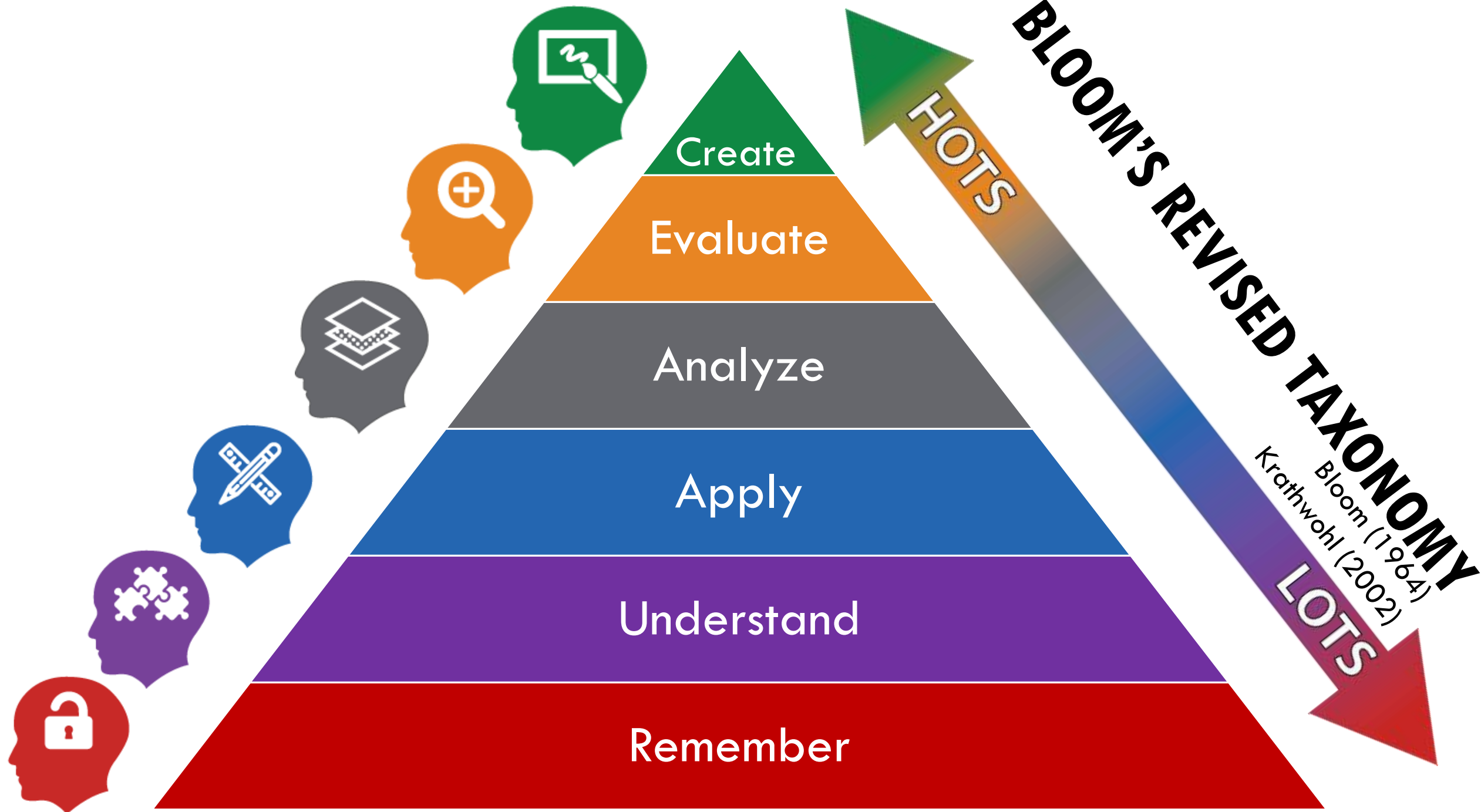
Knowledge	Comprehension	Application	Analysis	Evaluation	Creation
Recall /regurgitate facts without understanding. Exhibits previously learned material by recalling facts, terms, basic concepts and answers.	To show understanding finding information from the text. Demonstrating basic understanding of facts and ideas.	To use in a new situation. Solving problems by applying acquired knowledge, facts, techniques and rules in a different way.	To examine in detail. Examining and breaking information into parts by identifying motives or causes; making inferences and finding evidence to support generalisations.	To justify. Presenting and defending opinions by making judgements about information, validity of ideas or quality of work based on a set of criteria.	To change or create into something new. Compiling information together in a different way by combining elements in a new pattern or proposing alternative solutions.

Key words:

Knowledge			Comprehension			Application			Analysis			Evaluation			Creation		
Choose	Observe	Show	Ask	Extend	Outline	Act	Employ	Practice	Analyse	Examine	Prioritize	Agree	Disprove	Measure	Adapt	Estimate	Plan
Copy	Omit	Spell	Cite	Generalise	Predict	Administer	Experiment	Relate	Appraise	Find	Question	Appraise	Dispute	Opinion	Add to	Experiment	Predict
Define	Quote	State	Classify	Give exam-	Purpose	Apply	with	Represent	Arrange	Focus	Rank	Argue	Effective	Perceive	Build	Extend	Produce
Duplicate	Read	Tell	Compare	ples	Relate	Associate	Group	Select	Assumption	Function	Reason	Assess	Estimate	Persuade	Change	Formulate	Propose
Find	Recall	Trace	Contrast	Illustrate	Rephrase	Build	Identify	Show	Breakdown	Group	Relation-	Award	Evaluate	Prioritise	Choose	Happen	Reframe
How	Recite	What	Demon-	illustrate	Report	Calculate	Illustrate	Simulate	Categorise	Highlight	ships	Bad	Explain	Prove	Combine	Hypothesise	Revise
Identify	Recognise	When	strate	Indicate	Restate	Categorise	Interpret	Solve	Cause and	In-depth	Reorganise	Choose	Give reasons	Rate	Compile	Imagine	Rewrite
Label	Record	Where	Discuss	Infer	Review	Choose	Interview	Summarise	effect	discussion	Research	Compare	Good	Recommend	Compose	Improve	Simplify
List	Relate	Which	Estimate	Interpret	Show	Classify	Link	Teach	Choose	Inference	See	Conclude	Grade	Rule on	Construct	Innovate	Solve
Listen	Remember	Who	Explain	Match	Summarise	Connect	Make use of	Transfer	Classify	Inspect	Select	Consider	How do we	Select	Convert	Integrate	Speculate
Locate	Repeat	Why	Express	Observe	Translate	Construct	Manipulate	Translate	Differences	Investigate	Separate	Convince	know?	Support	Create	Invent	Substitute
Match	Reproduce	Write				Correlation	Model	Use	Discover	Isolate	Similar to	Criteria	Importance	Test	Delete	Make up	Suppose
Memorise	Retell					Demonstrate	Organise		Discriminate	List	Simplify	Criticise	Infer	Useful	Design	Maximise	Tabulate
Name	Select					Develop	Perform		Dissect	Motive	Survey	Debate	Influence	Validate	Develop	Minimise	Test
						Dramatise	Plan		Distinction	Omit	Take part in	Decide	Interpret	Value	Devise	Model	Theorise
									Distinguish	Order	Test for	Deduct	Judge	Why	Discover	Modify	Think
									Divide	Organise	Theme	Defend	Justify		Discuss	Original	Transform
									Establish	Point out	Comparing	Determine	Mark		Elaborate	Originate	Visualise

Actions: / Outcomes:

Knowledge Actions	Knowledge Outcomes	Comprehension Actions	Comprehension Outcomes	Application Actions	Application Outcomes	Analysis Actions	Analysis Outcomes	Evaluation Actions	Evaluation Outcomes	Creation Actions	Creation Outcomes
Describing	Definition	Classifying	Collection	Carrying out	Demonstration	Attributing	Abstract	Attributing	Abstract	Constructing	Advertisement
Finding	Fact	Comparing	Examples	Executing	Diary	Deconstructing	Chart	Checking	Chart	Designing	Film
Identifying	Label	Exemplifying	Explanation	Implementing	Illustrations	Integrating	Checklist	Deconstructing	Checklist	Devising	Media product
Listing	List	Explaining	Label	Using	Interview	Organising	Database	Integrating	Database	Inventing	New game
Locating	Quiz	Inferring	List		Journal	Outlining	Graph	Organising	Graph	Making	Painting
Naming	Reproduction	Interpreting	Outline		Performance	Structuring	Mobile	Outlining	Mobile	Planning	Plan
Recognising	Test	Paraphrasing	Quiz		Presentation		Report	Structuring	Report	Producing	Project
Retrieving	Workbook	Summarising	Show and tell		Sculpture		Spread sheet		Spread sheet		Song
	Worksheet		Summary		Simulation		Survey		Survey		Story

Questions:

Knowledge
Can you list three ...?
Can you recall ...?
Can you select ...?
How did _____ happen?
How is ...?
How would you describe ...?
How would you explain ...?
How would you show ...?
What is ...?
When did ...?
When did _____ happen?
Where is . . . ?
Which one ...?
Who was ...?
Who were the main . . . ?
Why did ...?

Comprehension
Can you explain what is happening . . . what is meant . . . ?
How would you classify the type of ...?
How would you compare ...?contrast ...?
How would you rephrase the meaning ...?
How would you summarise ...?
What can you say about ...?
What facts or ideas show ...?
What is the main idea of ...?
Which is the best answer ...?
Which statements support ...?
Will you state or interpret in your own words ...?

Application
How would you use...?
What examples can you find to ...?
How would you solve _____ using what you have learned ...?
How would you organise _____ to show ...?
How would you show your understanding of ...?
What approach would you use to...?
How would you apply what you learned to develop ...?
What other way would you plan to ...?
What would result if ...?
Can you make use of the facts to ...?
What elements would you choose to change ...?
What facts would you select to show ...?
What questions would you ask in an interview with ...?

Analysis
What are the parts or features of ...?
How is _____ related to ...?
Why do you think ...?
What is the theme ...?
What motive is there ...?
Can you list the parts ...?
What inference can you make ...?
What conclusions can you draw ...?
How would you classify ...?
How would you categorise ...?
Can you identify the difference parts ...?
What evidence can you find ...?
What is the relationship between ...?
Can you make a distinction between ...?
What is the function of ...?
What ideas justify ...?

Evaluation
Do you agree with the actions/outcomes...?
What is your opinion of...?
How would you prove/disprove...?
Can you assess the value/importance of...?
Would it be better if...?
Why did they (the character) choose...?
What would you recommend...?
How would you rate the...?
What would you cite to defend the actions...?
How would you evaluate ...?
How could you determine...?
What choice would you have made...?
What would you select...?
How would you prioritise...?
What judgement would you make about...?
Based on what you know, how would you explain...?
What information would you use to support the view...?
How would you justify...?
What data was used to make the conclusion...?

Creation
What changes would you make to solve...?
How would you improve ...?
What would happen if...?
Can you elaborate on the reason...?
Can you propose an alternative...?
Can you invent...?
How would you adapt _____ to create a different...?
How could you change (modify) the plot (plan)...?
What could be done to minimise (maximise)...?
What way would you design...?
Suppose you could _____ what would you do...?
How would you test...?
Can you formulate a theory for...?
Can you predict the outcome if...?
How would you estimate the results for...?
What facts can you compile...?
Can you construct a model that would change...?
Can you think of an original way for the ...?

Bloom's Taxonomy: Teacher Planning Kit

BLOOM'S DIGITAL TAXONOMY VERBS

Bloom's Digital Taxonomy (devised by Andrew Churches) is about using technology and digital tools to facilitate learning. This kind of engagement is defined by "power verbs" that can be used for everything from lesson planning and rubric making, to curriculum mapping and more.

This infographic features the span of the digital taxonomy. It begins with lower-order thinking skills (LOTS) on the left with Remembering, and ends on the right with Creating and higher-order thinking skills (HOTS). Listed beneath are the power verbs that apply to each stage.

Use the infographic as a tool for handy reference any time you need terms for planning and assessment!

LOTS ← → **HOTS**

Remembering
Remembering is when memory is used to produce definitions, facts or lists, or recite or retrieve material.

Bookmarking, Bullet-pointing, Copying, Defining, Describing, Duplicating, Favouriting, Finding, Googling, Highlighting, Identifying, Labelling, Listening, Listing, Locating, Matching, Memorizing, Naming, Networking, Numbering, Quoting, Reciting, Relating, Reading, Recognizing, Recording, Relating, Repeating, Retrieving, Searching, Selecting, Tabulating, Telling, Visualising

Understanding
Understanding is about constructing meaning from different types of function be they written or graphic.

Advanced searches, Annotating, Associating, Boolean searches, Categorizing, Classifying, Commenting, Comparing, Computing, Contrasting, Converting, Demonstrating, Describing, Differentiating, Discussing, Discovering, Distinguishing, Estimating, Exemplifying, Explaining, Expressing, Extending, Gathering, Generalizing, Grouping, Identifying, Indicating, Interpreting, Journaling, Paraphrasing, Predicting, Relating, Subscribing, Summarizing, Tagging, Tweeting

Applying
Applying refers to situations where learned material is used through products like models, diagrams, presentations, interviews and simulations.

Acting out, Administering, Applying, Articulating, Calculating, Carrying out, Changing, Charting, Choosing, Collecting, Completing, Computing, Concluding, Constructing, Demonstrating, Determining, Displaying, Dividing, Examining, Executing, Experimenting, Explaining, Hacking, Implementing, Interviewing, Judging, Editing, Experimenting

Analyzing
Analyzing means breaking material or concepts into parts, determining how the parts interrelate to one another or to an overall structure or purpose.

Advertising, Appraising, Attributing, Breaking down, Calculating, Categorizing, Classifying, Comparing, Concluding, Contrasting, Correlating, Debating, Deconstructing, Deducing, Detecting, Differentiating, Discriminating, Dividing, Distinguishing, Estimating, Explaining, Estimating, Experimenting, Illustrating, Inferring, Integrating, Linking, Mashing, Mind mapping, Ordering, Organizing, Outlining, Planning, Posting out, Prioritizing, Questioning, Separating, Structuring, Surveying

Evaluating
Evaluating means making judgements based on criteria and standards through checking and critiquing.

Arguing, Assessing, Checking, Commenting, Concluding, Considering, Convincing, Criticizing, Critiquing, Debating, Defending, Detecting, Editorializing, Experimenting, Grading, Hypothesising, Judging, Justifying, Measuring, Moderating, Monitoring, Networking, Persuading, Posting, Predicting, Rating, Recommending, Reflecting, Reframing, Reviewing, Revising, Scoring, Supporting, Testing, Validating

Creating
Creating is about putting elements together to form a functional whole, and reorganising elements into a new pattern or structure by planning or producing.

Adapting, Animating, Blogging, Building, Collaborating, Composing, Constructing, Designing, Developing, Devising, Directing, Facilitating, Filming, Formulating, Integrating, Inventing, Leading, Making, Managing, Mixing, Modifying, Mix-remixing, Negotiating, Networking, Organizing, Planning, Podcasting, Producing, Programming, Publishing, Role playing, Simulating, Solving, Structuring, Video Blogging, Wiki building, Writing

REFERENCES
http://edorigami.wikispaces.com/Bloom%27s+Digital+Taxonomy
http://www.freeroslabs.edu/documents/assessments/Blooms%20Taxonomy%20Action%20verbs
http://www.cte.cornell.edu/documents/Assessment%20-%20Blooms%20Taxonomy%20Action%20Verbs.pdf

Tablet & Web 2.0 Tools Based on Bloom's Taxonomy

CREATING

animating, videocasting, storytelling, video editing, podcasting, collaborating, audio recording/editing, publishing, filming, programming, directing,

PREZI · Google docs · Windows Live Movie Maker · TikiTok · Audacity · issuu · ANIMOTO · Piktochart

EVALUATING

critiquing, networking, posting, collaborating, conferencing, moderating, blogging, reviewing, simulation, commenting, monitoring, wiki-ing

KIDBLOG.org — Safe and simple blogs for your students · Google Earth · infogr.am · edmodo · posterous SPACES · 10 x 10 · shelfari — read. share. explore. · iCivics · Pre-Created Rubrics · VOXOPOP · iRubric

ANALYZING

surveying, structuring, mashing, deconstructing, outlining, organizing, linking, media clipping, video conferencing, relationship mind mapping, graphing

Scoop.it! · Tagxedo · del.icio.us · CREATE A GRAPH · QUIZREVOLUTION · dipity · SurveyMonkey · Pinterest · exploratree

APPLYING

presenting, interviewing, illustrating, editing, demonstrating, sharing, replying, podcasting

podomatic · Photosynth (Microsoft Live Labs) · PowerPoint · Shape Collage · voki · realworldmath.org · slideshare — Present Yourself · Glogster EDU — poster yourself · ESL ESLvideo.com · penzu · PicMonkey

UNDERSTANDING

word processing, annotating, categorizing, tweeting, subscribing, explaining, advanced searches, commenting, video conferencing, filtering

twitter · wikispaces — wikis for everyone · Google · THE PERIODIC TABLE OF VIDEOS · skype · JeopardyLabs — This is…not PowerPoint! · W

REMEMBERING

mind mapping, searching, listing, tagging, bookmarking, describing, social networking,

fotobabble · Wordle™ · bubbl.us · SPELLINGCITY.COM · Talking Photos · symbaloo

Bloom's Taxonomy Wheel