

Higher Order Thinking Skills (Bloom's Revised Taxonomy)

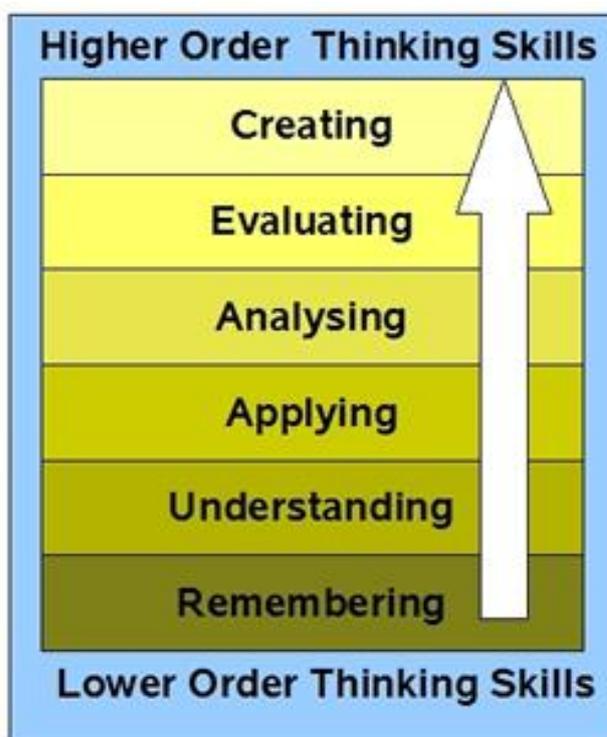
Summary

Higher Order Thinking Skills (HOTS) are types of learning that require higher cognitive processing and have more generalised benefits than Lower Order Thinking Skills (LOTS). Bloom's Taxonomy sets out cognitive processes from lower to higher order skills and can be used to think about creating opportunities to challenges learners at all levels. This advice sheet is aimed at lead teachers and teachers at all phases of education. The sheet outlines the different types of thinking skills and the kinds of questions and tasks that can be used for learners at each skill level.

Higher Order Thinking Skills (HOTS) are the cognitive processes that require thinking at a more complex, higher level. High potential learners often master the lower order tasks very quickly and need to think more deeply about topics. Planning a higher order thinking task or question into every lesson is a good way of ensuring **all** learners are given the opportunity to think at a high level, whilst ensuring the lesson interests and challenges high potential learners.

Bloom's (Revised) Taxonomy is a classification of learning objectives, which includes objectives that are perceived to be higher order and lower order. Learning at the higher levels is dependent on having knowledge and skills at lower levels. Thinking at the higher levels is also often called critical thinking and creative thinking.

There are six levels in the taxonomy, moving from the lowest order processes (Remembering) to the highest (Creating):



Remembering – Level 1 – Lower Order Thinking Skill

Retrieving, recalling or recognising knowledge from memory, used to produce definitions, facts or lists, or recite or retrieve material.

Understanding – Level 2 – Lower Order Thinking Skill

Demonstrating understanding of facts and ideas by organising, comparing, translating, interpreting, giving descriptions, and stating main ideas.

Applying – Level 3 – Middle Order Thinking Skill

Using new knowledge in new situations by applying acquired facts, techniques and rules in a different way.

Analysing – Level 4 – Higher Order Thinking Skill (Critical Thinking)

Examining and breaking information down into parts by identifying motives or causes. Making inferences and find evidence to support generalisations.

Evaluating – Level 5 – Higher Order Thinking Skill (Critical Thinking)

Presenting and defending opinions by making judgments about information, validity of ideas or quality of work based on a set of criteria.

Creating – Level 6 – Higher Order Thinking Skill (Creative Thinking)

Compiling information in a different way by combining elements in a new pattern or proposing alternative solutions, through generating, planning or producing.

Remembering and *Understanding* are lower order thinking levels that depend upon the learner's ability to pick up information and make sense of it. Some learners take longer to go through these stages, and others are able to master these quite quickly (and in some cases may already know and understand the information being presented).

Applying the knowledge depends on at least some *Understanding* being in place and helps to cement a learner's comprehension of the subject. Once a learner can apply the knowledge, he/she is ready to think in a more complex way about the topic and to start thinking critically and creatively.

Employing critical thinking skills means either *Analysing* or *Evaluating* the topic matter. Creative thinking skills are used through *Creating*. Each of these kinds of thinking allows the learner to use more cognitive processes, allows thinking to be more divergent, offers more challenge and will have more benefit for the learner.

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The table below shows some of the verbs used to ask questions of learners at each of the different levels of the taxonomy, along with example tasks and example questions:

Thinking Skill	Verbs Used	Example Tasks	Example Questions
Remembering	Name	List	How many...?
	Find	Timeline	Can you name...?
	Write	Facts	What is...?
	Tell	Recitation	True or false?
	List	Quiz	Who was it that...?
	State	Flashcards	What happened next?
	Recite	Bullet points	
Understanding	Describe	Summary	Can you tell me in your own words?
	Summarise	Explanation	Can you write a brief outline?
	Discuss	Mind map	Who was the key character?
	Outline	Presentation	Why did... happen?
	Predict	Timeline	Do you know another instance when...?
	Interpret	Scrapbook	Can you develop a set of instructions?
	Explain	Examples	What questions would you ask of...?
Applying	Demonstrate	Illustration	How can...change?
	Solve	Project	How is this similar to...?
	Use	Roleplay	Compare and contrast?
	Apply	Map	What are other possible outcomes?
	Illustrate	Diorama	Distinguish between?
	Construct	Leaflet	
	Examine	Newspaper Article	
Analysing	Categorise	Diary	Judge the value of...?
	Analyse	Collection	Do you think...is a good or bad thing?
	Classify	Illustration	How would you feel if?
	Compare	Questionnaire	How effective are...?
	Contrast	Flow-chart	
	Separate	Model	
	Relate	Diagram	
Evaluating	Judge	Survey	
	Critique	Graph	
	Justify	Report	
	Debate	List criteria	
	Recommend	Debate	
	Prioritise	Essay	
	Experiment	Written case	
Creating	Design	Story	Can you design a...?
	Create	Poem	How many ways can you...?
	Plan	Play	What would happen if...?
	Construct	Song	Can you see a possible solution to..?
	Invent	Animation	
	Devise	Invention	
	Make	Website	

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Further Information

S307 Bloom's Revised Taxonomy Resource	This resource suggests question cues and tasks at every level of thinking skills in Bloom's Revised Taxonomy. It can be used by class teachers to set tasks and questions at the different levels of thinking.
S308 Bloom's Digital Taxonomy Resource	This resource shows how tasks might be set using digital technology at every level of thinking skills in Bloom's Revised Taxonomy. It can be used by class teachers to set digital tasks and homework at the different levels of thinking.
<i>Teaching Thinking Pocketbook</i> by Anne De A'Echevarria and Ian Patience	Takes 5 types of thinking that learners typically struggle with and matches them with 'thinking tools'.

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