Handout 5

# Examples of active learning approaches relevant to teaching mathematical content in STEM subjects

The approaches do not need to be used on their own. They can often be most effective when paired together. The approaches in bold are included in the handout of quick start guides.

*e.g. The students create flow charts whilst using Think-Pair-Share to encourage discussion.*

Approaches could involve students giving written responses (e.g. via online software, on a whiteboard, or on paper), oral responses (e.g. speaking with others in pairs, a small group or the whole class) or even physical responses (e.g raising their hands, or moving around the room).

1. **Questioning**
2. **Think-Pair-Share**
3. **Thinking Environment**
4. **Open questions - Mini whiteboards / online answers**
5. **Multiple-choice questions - quizzes, voting, polls, exit tickets**
6. **Visual or symbolic representation – concept maps, flow charts, mind maps**
7. **Problem Based Learning**
8. **Peer feedback**
9. **Socratic Seminars**
10. Enquiry Based Learning
11. Modelling and laboratories
12. Peer teaching
13. Experiential learning
14. Simulation-based learning
15. Flipped classroom
16. Playful learning
17. Project Based Learning
18. RAG rating
19. S.W.O.T analysis
20. Gamification
21. Weekly problems

The most important thing to consider is how you are using the activities to encourage higher order thinking skills. It could be very easy to implement them and the students to not go beyond simply recalling (remembering) information. How you implement the activities is crucial to consider.