

Generating Knowledge for STEM Breakthroughs

- *The Proof* and mathematics and scientific research
- What practices do you employ in order to encourage the flashes of insight that you need for school?

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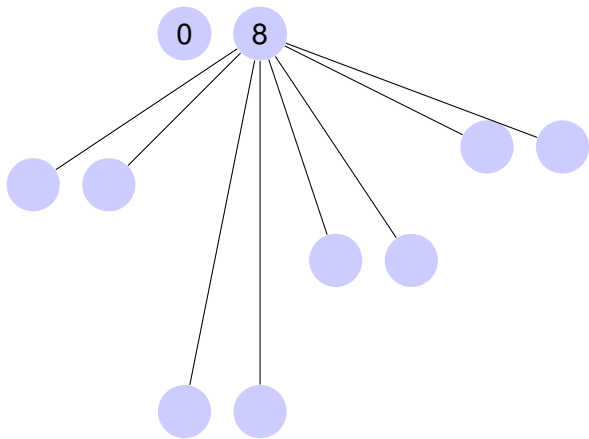
- *The Proof* and mathematics and scientific research
- What practices do you employ in order to encourage the flashes of insight that you need for school?
- Problem solving, gamification (games) and puzzles

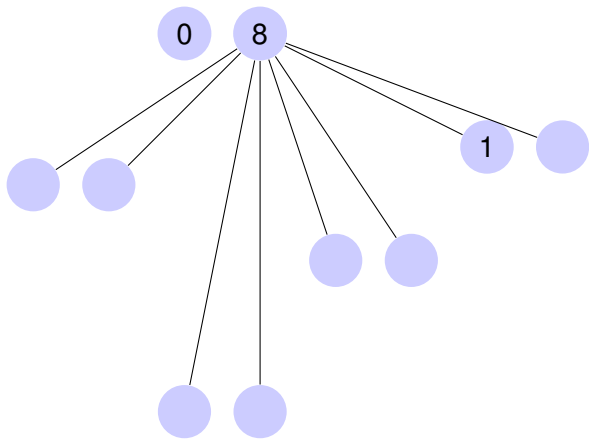


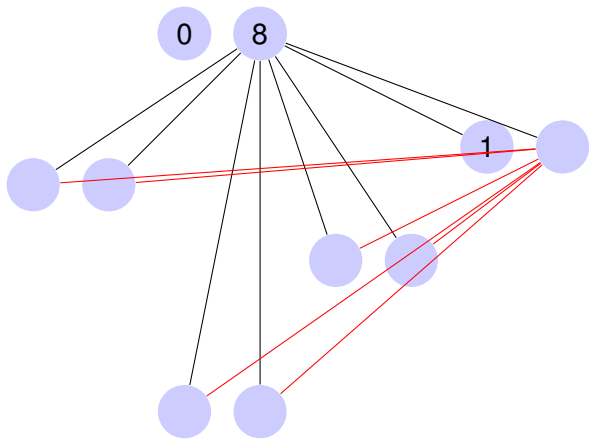
Astrophysics Handshake Party Puzzle

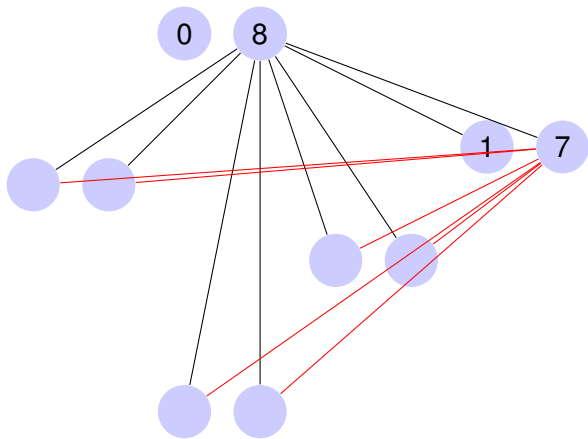
- American astrophysicist Neil deGrasse Tyson attends a party with his wife Alice Young and 8 additional people.
- Every person shakes hands with only the people he or she is not already acquainted with.
- Tyson asks everyone else how many hands they shook.
- To his surprise, they told him nine different answers.
(assume that everyone knows someone—otherwise how would they know about the party?)
- How many hands did Neil deGrasse Tyson shake?

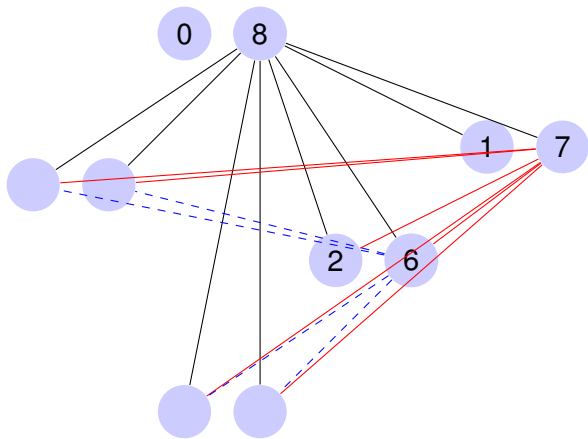


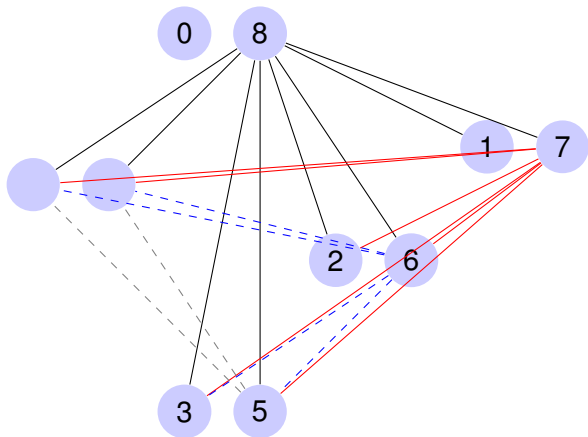


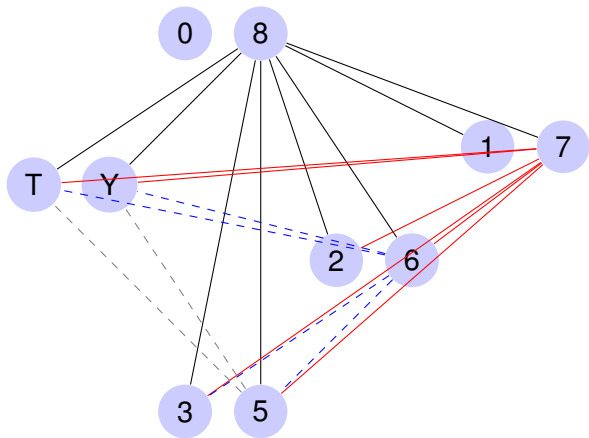












Research - How do you generate knowledge?

- Attempt your problem without outside help and reflect on your strategies. No need to solve the questions.
- Work on your problem goal and (if time allows) some of the related extensions. Keep track of your research processes.
 - 1 Did your group use paper, manipulatives, pictures, or some combination?
 - 2 What general strategies did you try? Did you look at examples and then try and look for patterns, dive right in and attack the problem head on, plot out a strategy and division of the work, etc.?
 - 3 How did you communicate and work with each other - did you work alone and then explain to each other what you had done, or work collaboratively, or some of each? Did you split up portions of the problem?
 - 4 Did your group enjoy working on your problem? If so, what was enjoyable? What would have made it more enjoyable?