Activity: Pillars of Computational Thinking

Context:
Include relevant information from the following...

- Undergraduate or graduate students of education
- Instructional Planning course taught by Education faculty. This course offers the first CS/CT-related activities in a 3-course sequence.
- Germain to all disciplines K-12
- No prior knowledge needed

Standards for CS Teachers:

- CS Knowledge & Skills 1a Apply CS practices
- Instructional Design 4d. Build connections between CS and other disciplines
- Instructional Design 4f. Plan instruction to foster student understanding

Activity Type:

- Lesson with follow-up reflection
- Delivery: online, hybrid, or face-to-face
- Length of time: approximately 90 minutes
- Key CS concepts/LOs: Algorithms, Pattern Matching, Decomposition, Abstraction

Description:
Teacher candidates complete the unplugged activity "Game with No Instructions" (https://code.org/curriculum/course3/1/Teacher), view two short videos about computational thinking (links on the slides provided below) while taking notes about each pillar: Decomposition, Pattern matching, Abstraction, Algorithms (automation). They then discuss how each pillar was used in the activity, and how each pillar may apply to their licensure fields (any field K-12 is applicable). Next they explore some resources (see links on slides provided below) for activities they would be interested in using in their future classrooms, and create an infographic for that activity.

Additional Resources:

- [Slides] "What is Computational Thinking" provide step-by-step instructions as well as links to videos and other resources needed.

References:

Wing, J.M. (2006) Computational Thinking. *Communications of the ACM*, 49, 33-35. https://doi.org/10.1145/1118178.1118215

Krauss, J. & Prottsman, K. (2016). *Computational Thinking and Coding for Every Student: The Teacher's Getting-Started Guide*. Corwin.

CSUnplugged csunplugged.org: Activity 1-Computational Thinking:
https://code.org/curriculum/course3/1/Activity1-ComputationalThinking.pdf

Attribution: Ideas from others were assembled into this Teacher Education lesson by Beth LaVigne, Assistant Professor, The College of St Scholastica blavigne@css.edu