**Introduction**

We envision this teaching tibit as a foundational activity occurring early in the semester in an introductory biology course.

Students will enter with different levels of biological knowledge. (in much the same way that today’s audience members do)

The aim is to enable students to build a conceptual framework that they can (or we can together) modify and fill in over the course of the semester. [Perhaps summarize learning goal(s) here?]

 We will focus on information flow in biological systems. There are fundamental principles underlying information flow, and we’d like to you explore some of the connections between these principles.

Maybe here or later: Mention concrete, accessible examples of information flow: Karen’s hamburger example, soccer example. (The smell of food can be a signal that causes you to go get hamburger. Information flow is involved when a player is getting ready to kick a soccer ball.)

Information flow occurs on different levels of biological organization – for example within cells, between cells, and between individuals. Information also flows between these levels, to make life possible. We’ll ask different groups to think about information flow at different levels of biological hierarchy (and come together at the end to form a broader picture).

For this activity, we’ve combined ideas from concept mapping and strip sequencing. Broad principles of information flow are printed on individual pieces of paper. Essentially, we are asking you to arrange statements of information flow principles in a logical way. The arrangement does not have to be linear.

Logistics . . . .

**Summary**

Point out that all groups arranged the same principles/pieces of paper, although the arrangements are different. (Colors will help.)

Positive: As demonstrated by the maps, students have a starting point, a frame of reference, some knowledge for this course already.

Room to grow: Some of the details of the maps are incorrect or vague. Perhaps you found you didn’t have the terminology or concepts you needed to flesh out the map. This course will (would) give you the opportunity to fill these kinds of gaps in biological knowledge. (metacogniction; helping students assess their own learning – The same activity could be repeated at the end of the semester. Initial maps could be photographed and stored for comparison to end-of-semester maps.)

**Learning goals:**

At the conclusion of this activity, students should understand that similar information flow principles function on multiple levels. (All groups arranged the same principles/pieces of paper.)

Students should understand that some mechanisms are shared among levels, while other mechanisms are level-autonomous. (The details will differ; the patterns, connections, and examples differ for each group.)

Students should be able to organize general biological principles in a logical way and to give a concrete example for a process that encompasses these principles. (Formative assessment: Making the concept/strip/statement maps today. This activity could be re-visited throughout the semester, including on exams – for summative assessment, asking students to work with more specific examples/biological processes discussed in class.)

**Rationale: (Buzz)**

We believe that students are capable learners, but because we, as instructors, tend to emphasize facts, many students have little understanding of common underlying principles. Therefore, we chose information flow as the model that will facilitate student understanding of basic principles in very different, yet interdependent, biological systems.