Envision biology students reconstructing scientific ideas in their own words and linking these concepts within a self-composed graphic design. What novel low-tech teaching tool could stimulate such meaningful learning? This is the promise of the Roundhouse diagram (see Figure 1), proposed in 1994 by Wandersee. Roundhouse diagramming helped graduate science education students (Trowbridge & Wandersee, 1998) and middle school general science students (Ward, 1999) learn complex concepts and retain that knowledge.

In this article, we extend application of this technique to high school biology students. We explain and model each step in Roundhouse diagram construction, provide strategy guidelines, and list suitable biology topics. Our advice is grounded in 30 high school biology students’ experiences with making Roundhouse diagrams (Hackney & Ward, 2000). These students’ work provided inspiration for sample diagrams and icons which illuminate our explanations.

To construct a Roundhouse diagram, a student identifies key concepts and captures this critical knowledge in brief statements. Next, a student relies on personal interpretation to relate each key concept to an image. Student recall is strengthened by storing information in verbal and visual modes within a diagram. This is consistent with Paivio’s Dual-Coding Theory (1986) which stresses the importance of separate processing of images and language in development of visual-verbal memory.

To construct a Roundhouse diagram, a student builds on mental representations of what he or she already knows (Ausubel, 1968). A learner engages in active experimentation with the lesson and past experiences. A student may identify missing relationships in order to anchor new knowledge to previously learned material (Novak &