**Inventory:**

* Backboard with fixed pieces and holes for puzzle parts (x1)
* Circles labeled “enzyme” (x4) fixed to the backboard
* Squares labeled “P1” (x2) one should be fixed to the backboard and attached to puzzle piece “P2”, one loose
* Triangles labeled “P2” (x2) one should be fixed to the backboard and attached to puzzle piece “P1”, and one should be loose
* Pieces labeled “substrate” (x2) both should be loose from the board, and will feel similar, but labeled differently, from the “P1” “P2” piece attached to to board

**Learning Objective:**

* Students will use their knowledge of the enzyme cycle to create a 3D diagram that conveys the process of how enzymes make products

**Why are enzymes important?**

* Enzymes create chemical reactions in the body that help to keep an organism like your or me, alive
* They create these reactions, and lower the amount of energy your body has to use to support them
* The reactions they create help to build muscle, break down the food we eat, destroy foreign toxins, and so much more

**Step 1:**

* Find a piece labeled “Substrate” and feel on the board, in the top left hand corner, for an area labeled “1”.
* From there, feel for a divot on the board, shaped like your “substrate” piece, this is where you will insert the “substrate” piece and begin building your diagram
* At this point in the cycle, the substrate has not yet entered the active sight of the enzyme, and is floating around, ready to be paired

**Step 2:**

* Find a second piece labeled “Substrate” and feel on the board, in the top right hand corner, for an area labeled “2”.
* Feel for another divot on the board, shaped like your “substrate” piece, this is where you will insert the “substrate” piece and begin building your diagram
* Also feel for the fixed piece labeled “enzyme” to see where the two pieces meet
* Step 2 stands for a point in the cycle where the enzyme has converged with the substrate, and has now formed an enzyme substrate complex

**Step 3:**

* Feel across the bottom left hand corner of the border for the number “3”, this stands for the third step
* In this step you will have three fixed pieces, “P1” “P2” and “Enzyme”
* Notice how the piece initially labeled substrate has now split into two pieces labeled “P1” and “P2” these stand for product 1, and product 2
* At this phase in the cycle an enzyme product complex has been formed

**Step 4:**

* Feel across the bottom left hand corner of the border for the number “4”, this stands for the fourth and final step
* Find, off to the side, two loose pieces labeled “P1” and “P2”, your two products
* Feel for a divot on the board where these pieces might fit, and notice how they are no longer attached to your enzyme piece
* Fit the pieces into their spots
* At this phase in the cycle, the products have been released and the enzyme cycle can start again.

