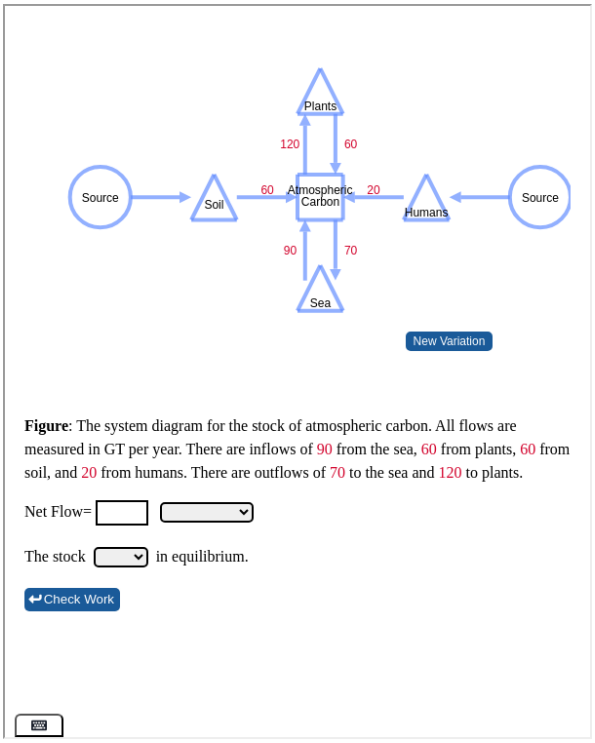
1 Net Flow

Let's practice computing the net flow of a stock.

1. The following system diagram is for the stock of atmospheric carbon, measured in gigatons (GT). The flows are measured in GT per year. We are accounting for inflows from plants (plant respiration), sea (air/sea gas exchange), soil (microbial respiration and decomposition), and humans (human emissions), and for outflows to plants (photosynthesis) and sea (air/sea gas exchange).

Choose new variations of the model by selecting the "New Variation" button. Before moving on, get at least 3 correct in a row, and write down an explanation for how to compute net flow and what that means for the behavior of a stock as if you were explaining it to someone new.



2 Residence Time

In your group, answer the following questions to better understand residence time.

1. Does this calculation make sense for stocks not in equilibrium? Why or why not?

2. What type of units do you think this number will have? Why? Give at least one example.

3. Consider a stock-flow model whose stock is number of undergraduate students at a University, with a single inflow of admitted students and a single outflow of graduating students. Assuming this stock is in equilibrium, calculate the residence time of the stock for each scenario below. Discuss its meaning in the context of the model.

(a) Equilibrium value: $5,000$ students, Flow Rate: $5,000$ students per year

(b) Equilibrium value: $5,000$ students, Flow Rate: $1,000$ students per year

(c) Equilibrium value: $5,000$ students, Flow Rate: 100 students per year

(d) Equilibrium value: $5,000$ students, Flow Rate: $2,500$ students per year

(e) Equilibrium value: $5,000$ students, Flow Rate: $10,000$ students per year