Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block \_\_\_\_\_\_ Binder Page # \_\_\_\_\_\_

**Feedback Loops and Climate Notes**

1. Stimulus – a T\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or event that evokes a specific R\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Negative Feedback – when the response D\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the O\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

stimulus. System is S\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

3. Positive Feedback – when the response E\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the O\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

stimulus. System C\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ over time.

4. Feedback Loops

Positive Feedback-Situation at the S\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is in the middle.

Over time there is either an E\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or Blocking.

There is no Intermediate S\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Negative Feedback-Situation at the S\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are separated.

Over time the situations cross and C\_\_\_\_\_\_\_\_\_\_\_\_\_ and C\_\_\_\_\_\_\_\_\_\_\_\_

Eventually they meet at the G\_\_\_\_\_\_\_\_\_\_\_\_.

5. Feedback Loops – Another way to visualize it.

Negative Feedback – Disturbances are D\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

System remains near it’s S\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ point.

Positive Feedback – Disturbances are A\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

System may E\_\_\_\_\_\_\_ U\_\_\_\_\_\_ far from its S\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ point.

6. Positive Feedback is Less Common

Understandable – most changes to steady state pose a T\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and to enhance them would

be M\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ U\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

7. Positive Feedback Loops

Response S\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ initial stimulus

Response gets G\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and G\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ over time or

S\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and S\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ over time.

Ex. More cattle run – M\_\_\_\_\_\_\_\_\_\_ panic – more C\_\_\_\_\_\_\_\_\_\_\_\_\_\_ run – more P\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ripe F\_\_\_\_\_\_\_\_\_\_\_\_\_ produces more ethylene 🡨---------🡪 Ethylene makes fruit R\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. Negative Feedback is the most common in biological systems.

Conditions stay within a S\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ R\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Ex. Thermostat / Furnace in a house – How?

Ex. Plants and CO2 – more CO2 in atmosphere > increase in P\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ growth > Plants

R\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ CO2 from the A\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

System is stabilized. Amount of CO2 in air R\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the S\_\_\_\_\_\_\_\_\_\_\_\_\_ over time.

9. Predator – Prey Relationship

More Antelope -------🡪 Cheetah Population G\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Stable Population

Fewer Antelope ----🡪 Cheetah Population S\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. Big Picture – Climate Science is Complicated

Positive and N\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Feedback Loops are A\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ simultaneously.

Making Predictions about F\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ climate Conditions is very D\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

11. Permafrost….

Temperature rise > Permafrost T\_\_\_\_\_\_\_\_\_\_\_\_ > Gases are released > Temperatures R\_\_\_\_\_\_\_\_\_\_\_........

12. Earth’s Carbon Cycle