

**Dung beetles use their dung ball as a mobile thermal refuge**  
*Smokla et al 2012, Current Biology*

What overarching question does this paper seek to answer?

Where were these experiments conducted? What techniques were used?

Interpret the results:

What is the key finding of Figure 1A?

What is the key finding of Figure 1B?

What is the key finding of Figure 1C?

What is the purpose of the boots? (!)

What is the purpose of the hot and cool balls?

What are the two key findings of Figure 1D?

Therefore, what 3 thermal functions does the dung ball play?

What else do you want to know now?

Connect to class material:

To what phylogenetic group do beetles belong? What structural adaptations might allow survival in the harsh environment of the desert?

How would you describe the temperature regulation of beetles?

What type of feedback is involved in this thermoregulation?

In what ways do you see the following means of heat transfer in this system?

Evaporation:

1)

2)

Radiation:

1)

Conduction:

1)

2)

In what ways has the dung ball provided a selective advantage for beetles?