4th Grade
Engineering Project

The Figure 8 Cooling System

Notebook

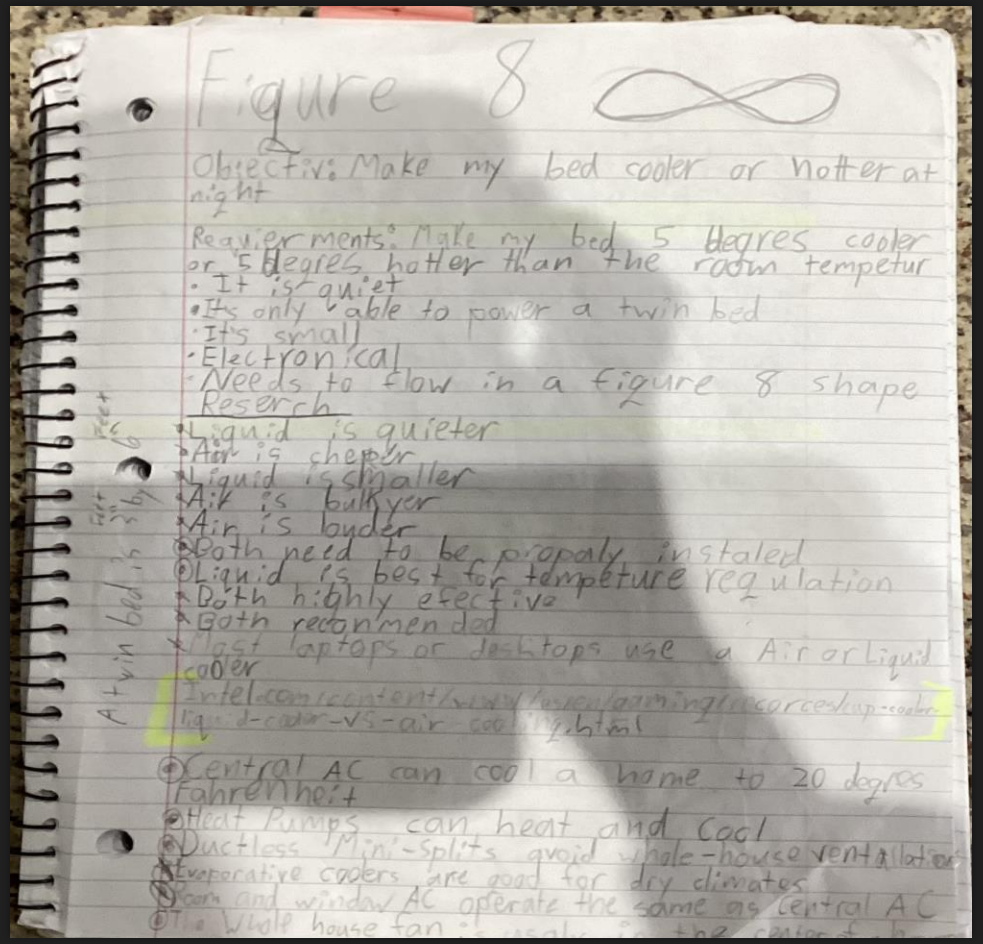

Figure 8

Objective: Make my bed cooler or hotter at night

Requirements: Make my bed 5 degres cooler or 5 degres hotter than the room tempetur
- It is quiet
- Its only able to power a twin bed
- Its small
- Electronical
- Needs to flow in a figure 8 shape

Research
- Liquid is quieter
- Air is cheaper
- Liquid is smaller
- Air is bulkyer
- Air is louder
- Both need to be propaly instaled
- Liquid is best for tempeture regulation
- Both highly efective
- Both recommended
- Most laptops or desktops use a Air or Liquid cooler

Intel.com/content/www/us/en/gaming/resources/cpu-cooler-liquid-cooler-vs-air-cooler.html

- Central AC can cool a home to 20 degrees Fahrenheit
- Heat Pumps can heat and cool
- Ductless Mini-Splits avoid whole-house ventilation
- Evaporative coolers are good for dry climates
- Room and window AC operate the same as central AC
- The whole house fan

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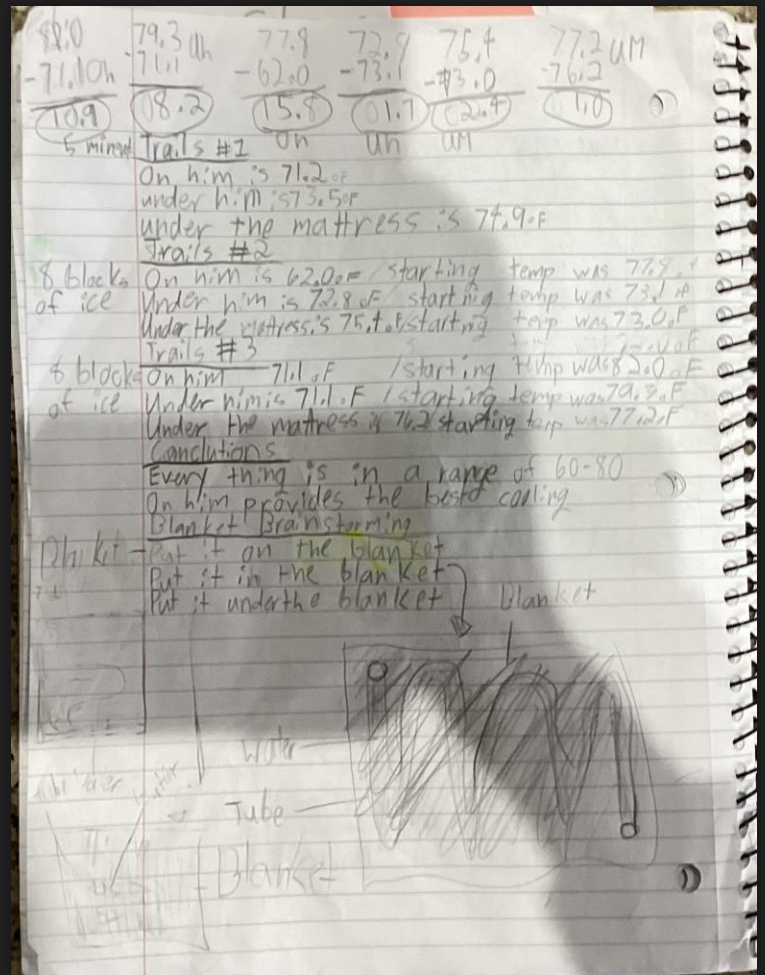
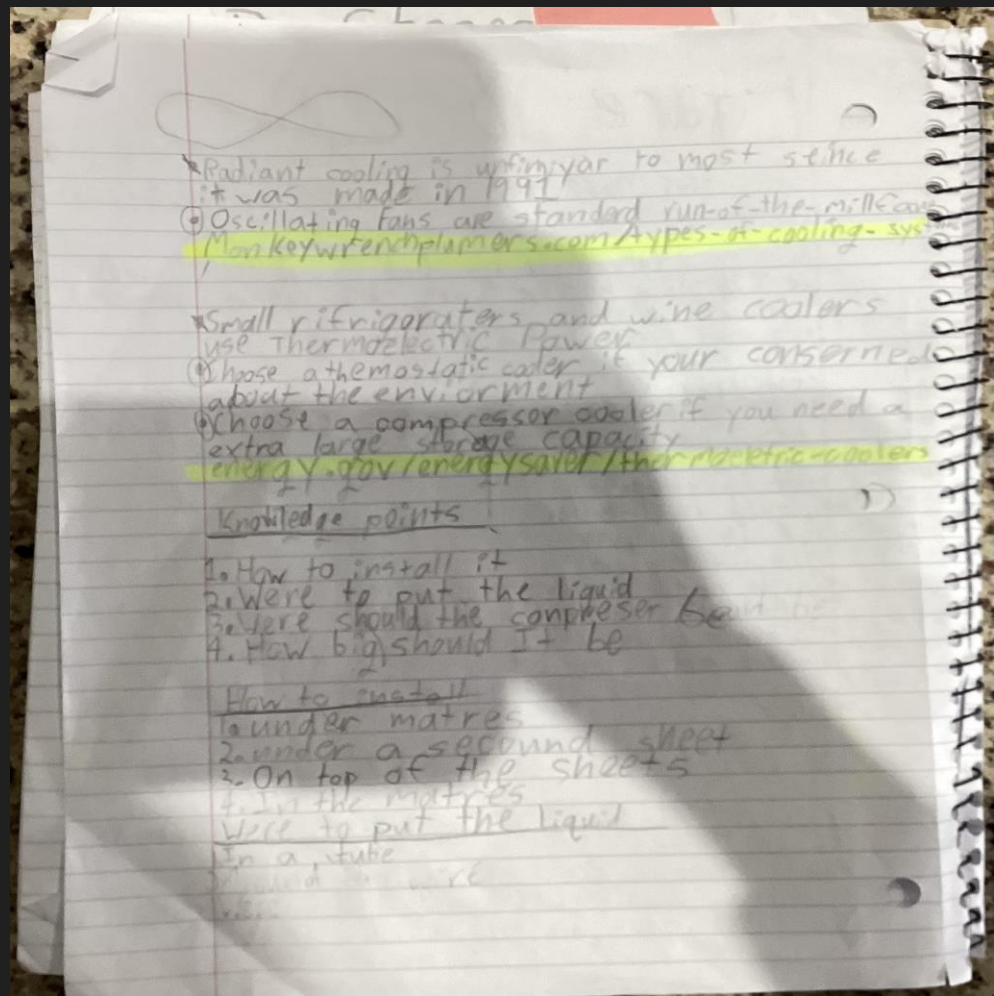
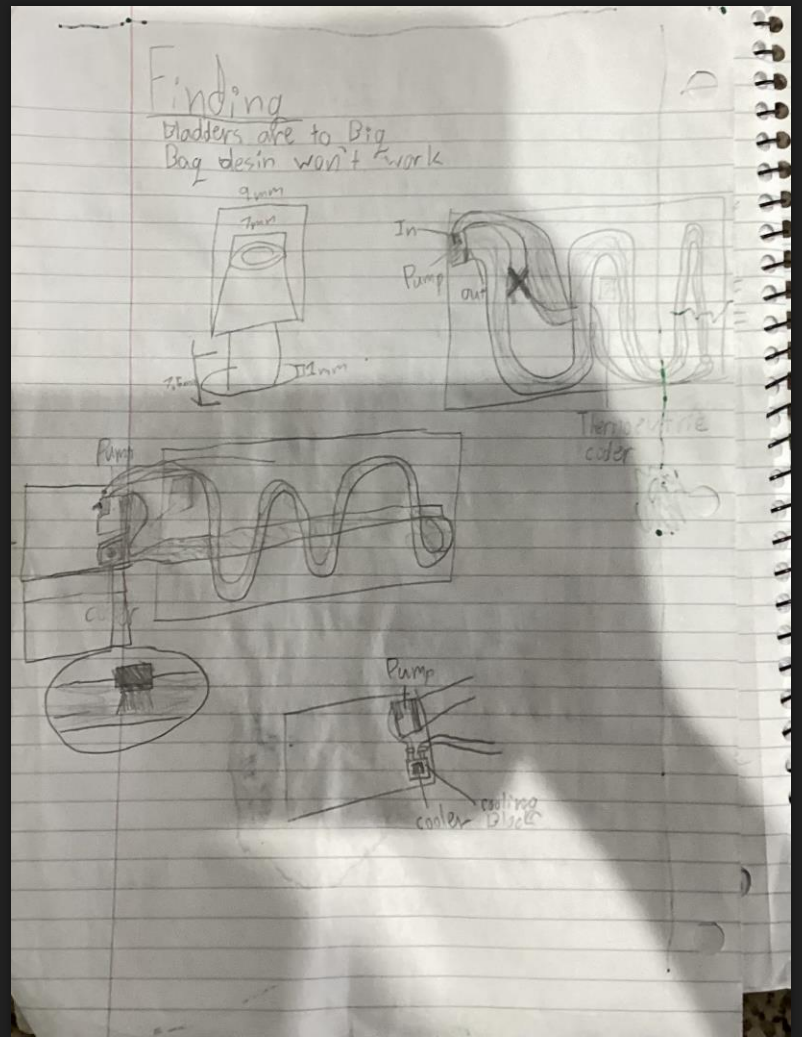
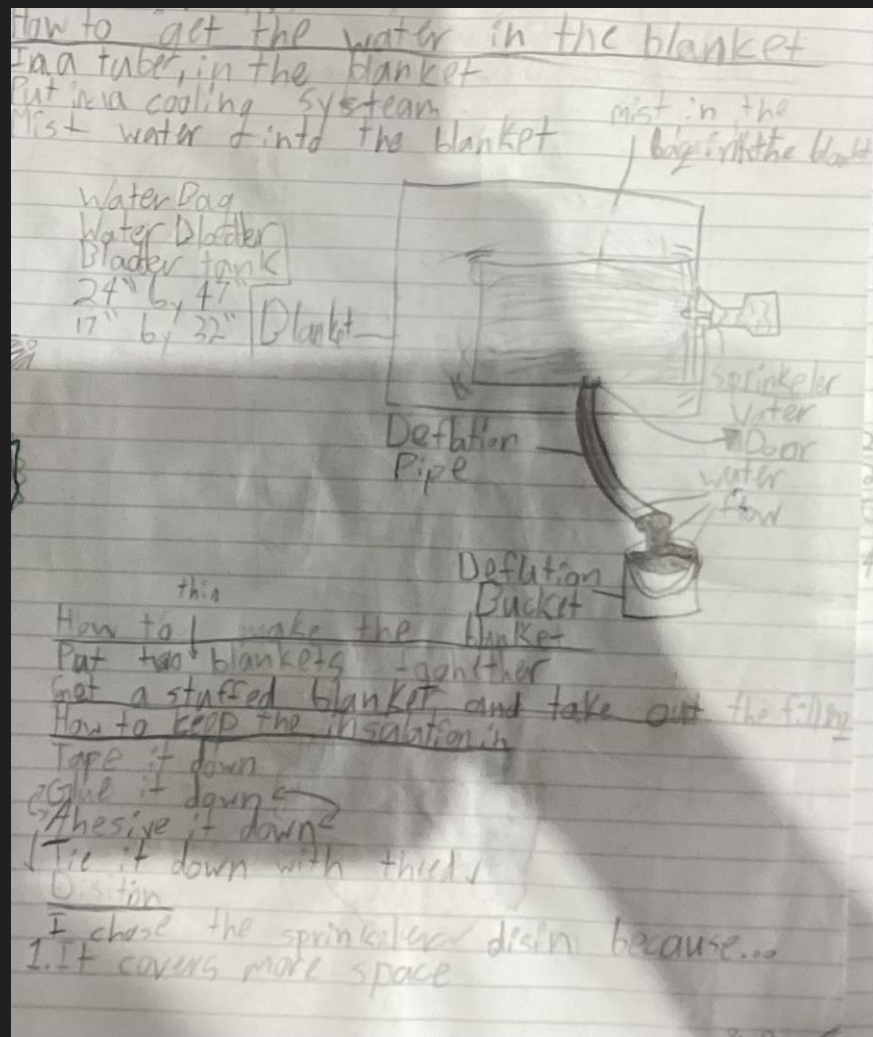

Trails #1
On him is 71.2
under him is 73.5
under the mattress is 74.9
Trails #2
On him is 62.0
Under him is 72.8
Under the mattress is 75.4
Trails #3
On him 71.1
Under him is 71.1
Under the mattress is 76.2
Conclusions
Every thing is in a range of 60-80
On him provides the best cooling
Blanket Brainstorming
Put it on the blanket
Put it in the blanket
Put it under the blanket
Blanket
Water
Tube
Blanket

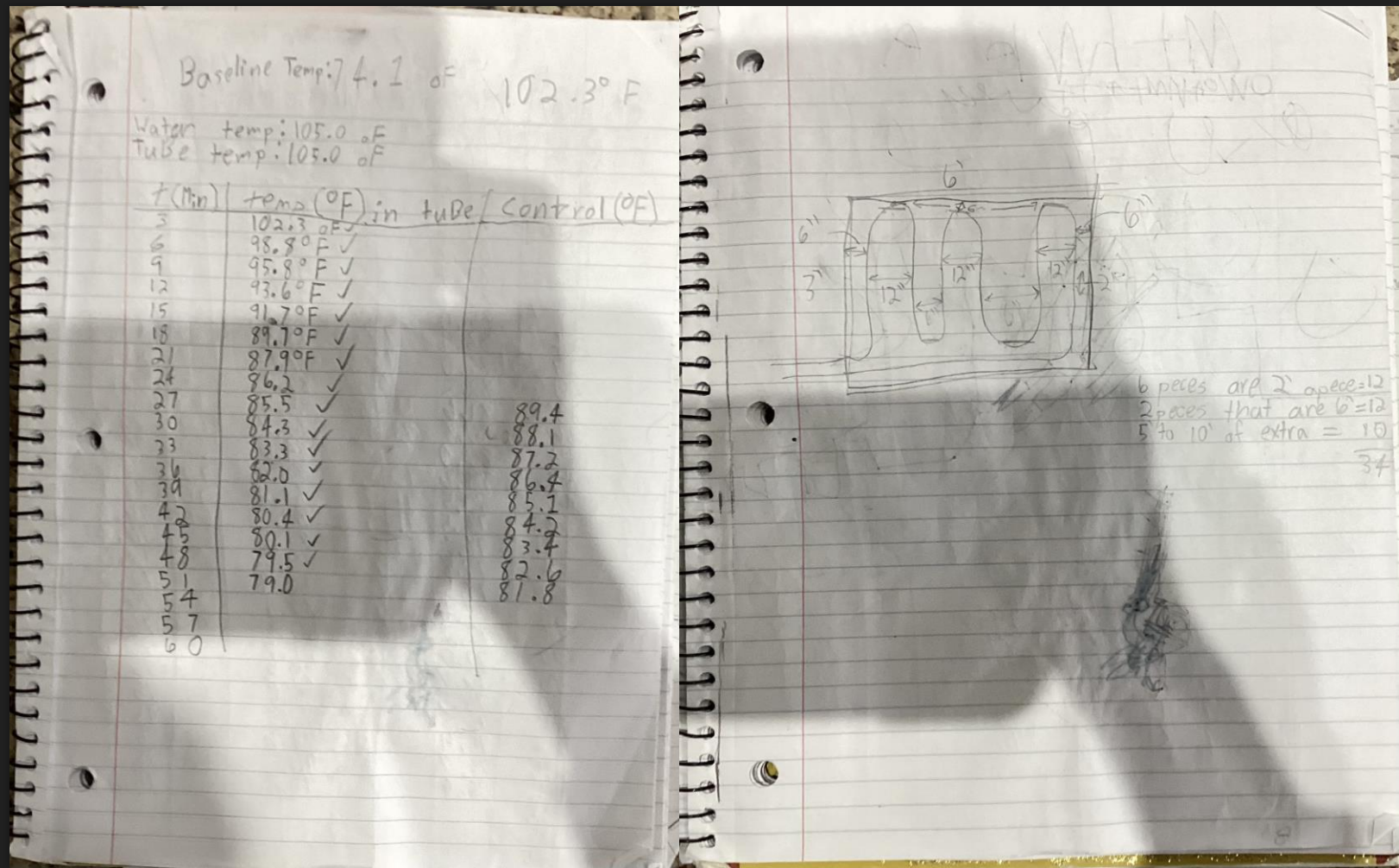

Radiant cooling is uptin year to most since it was made in 1991
Oscillating fans are standard run-of-the-mill
Small refrigerators and wine coolers use Thermoelectric Power
Choose a themostatic cooler if your concerned about the enviorment
Choose a compressor cooler if you need a extra large storage capacity
Knowledge points
1. How to install it
2. Were to put the liquid
3. Were should the compreser be
4. How big should it be
How to install
1. under matres
2. under a second sheet
3. On top of the sheets
4. In the matres
Were to put the liquid
In a tube

Notebook

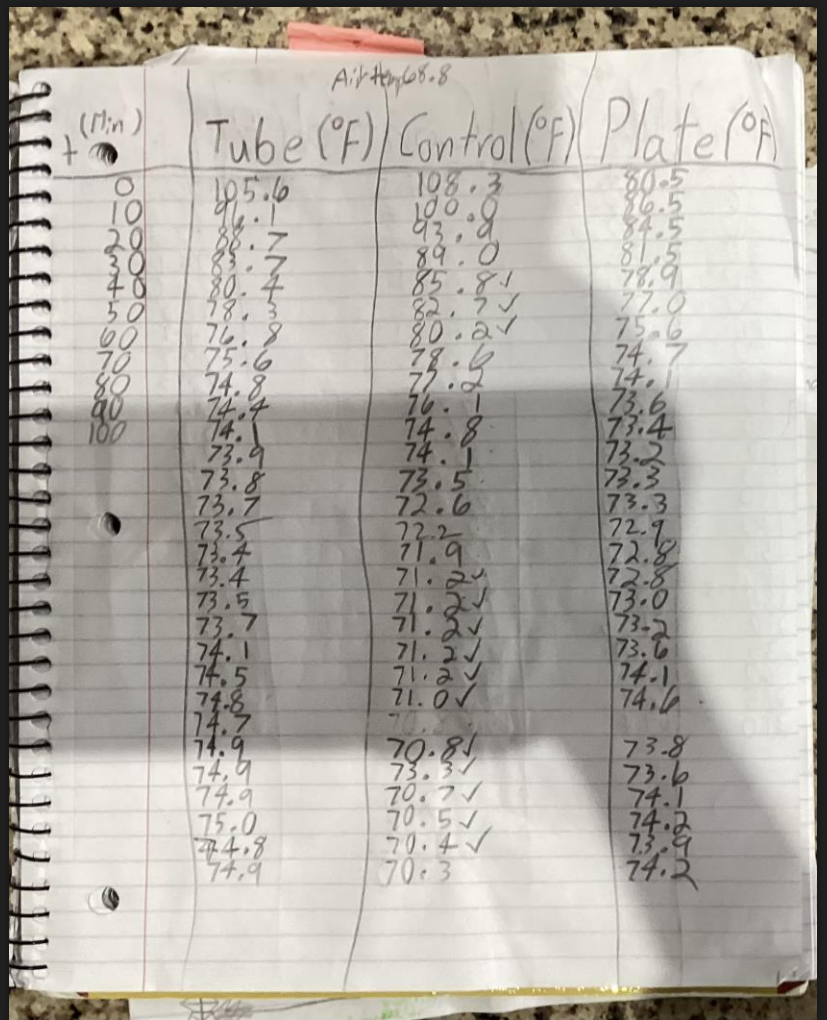

Finding
bladders are to Big
Bag desin won't work
Pump
In
Pump
out
Pump
Pump
cooler
cooling Block

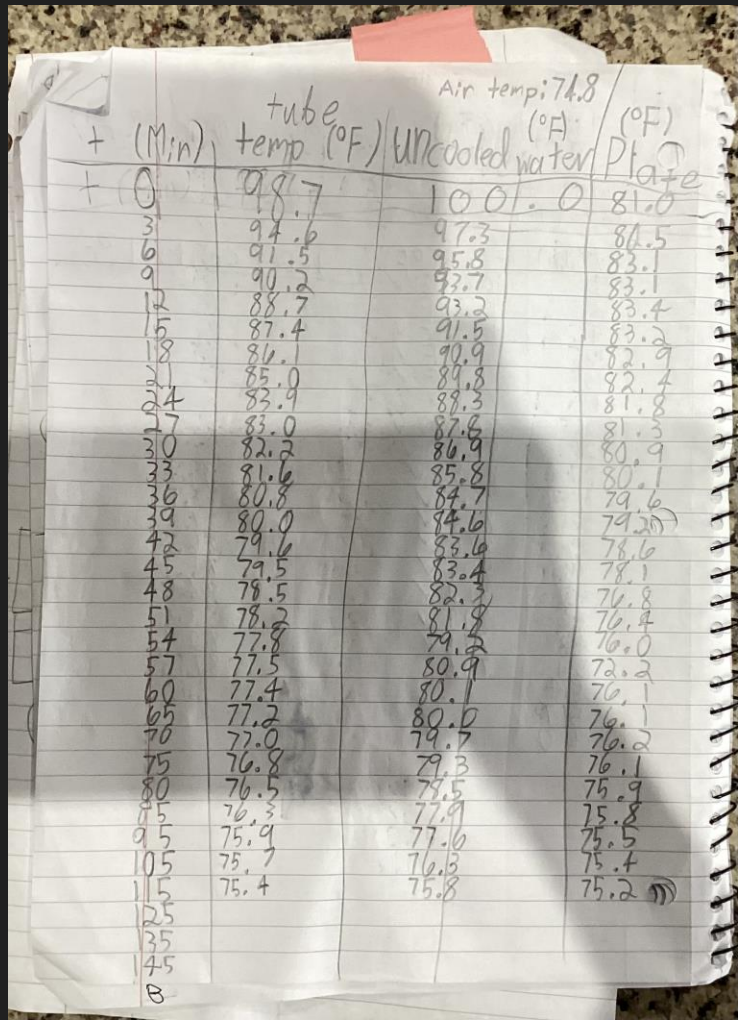

How to get the water in the blanket
In a tube, in the blanket
Put in a cooling system
Mist water into the blanket
mist in the bag with the water
Water Bag
Water Bladder
Bladder tank
24" by 47"
17" by 32"
Blanket
Sprinkler
Water
Door
water
flow
Deflation Pipe
Deflation Bucket
How to make the blanket
Put two blankets together
Get a stuffed blanket and take out the filling
How to keep the insulation in
Tape it down
Glue it down
Adhesive it down
Tie it down with thread
I chose the sprinkler desin because...
1. It covers more space

Notebook

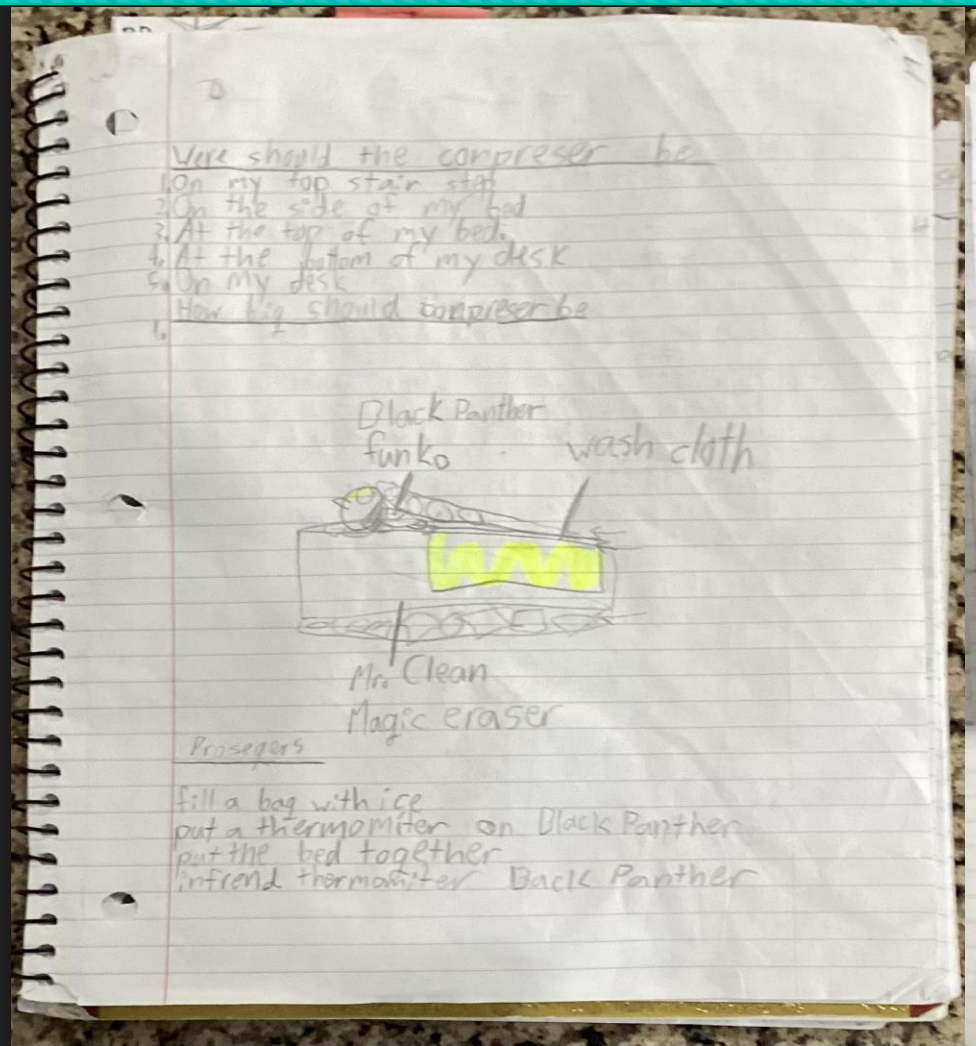

Baseline Temp: 74.1 °F 102.3° F
Water temp: 105.0 °F
Tube temp: 105.0 °F
t (Min) | temp (°F) in tube | Control (°F)
3 102.3 °F
6 98.8° F ✓
9 95.8° F ✓
12 93.6° F ✓
15 91.7° F ✓
18 89.7° F ✓
21 87.9° F ✓
24 86.2 ✓
27 85.5 ✓
30 84.3 ✓
33 83.3 ✓
36 82.0 ✓
39 81.1 ✓
42 80.4 ✓
45 80.1 ✓
48 79.5 ✓
51 79.0
54
57
60
89.4
88.1
87.2
86.4
85.1
84.2
83.4
82.6
81.8
6"
6"
6"
3"
12"
12"
12"
6 pieces are 2 apiece=12
2 pieces that are 6=12
5 to 10' of extra = 10
34

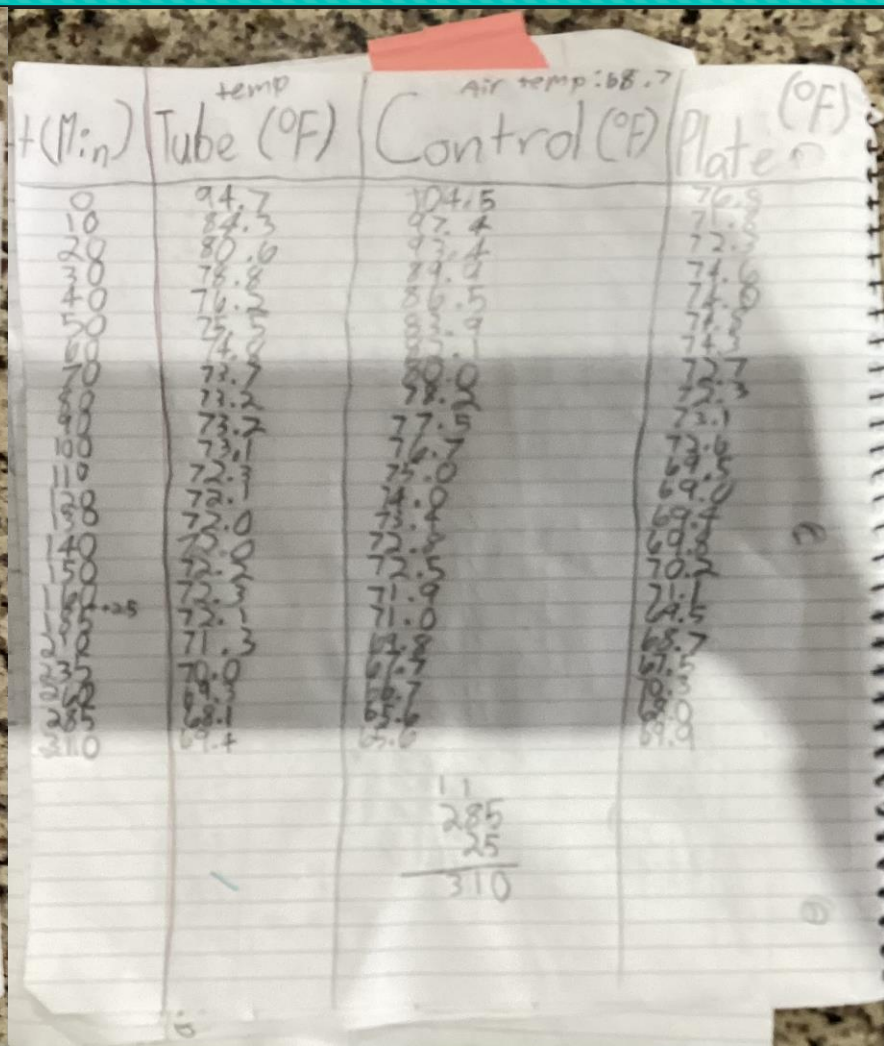
Notebook


Air temp: 68.8
t (Min)
Tube (°F)
Control (°F)
Plate (°F)


Air temp: 71.8
t (Min)
tube temp (°F)
uncooled water (°F)
Plate (°F)

Notebook


Where should the compreser be
1. On my top stair step
2. On the side of my bed
3. At the top of my bed
4. At the bottom of my desk
5. On My desk
How big should compreser be
Black Panther
funko
wash cloth
Mr. Clean
Magic eraser
Prosegers
fill a bag with ice
put a thermometer on Black Panther
put the bed together
infrend thermometer Back Panther


temp
Air temp: 68.7
(°F)
t (Min)
Tube (°F)
Control (°F)
Plate
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310
94.7
84.3
80.6
78.8
76.5
75.5
74.8
73.7
73.2
73.7
73.1
72.3
72.1
72.0
72.0
72.5
72.3
72.1
71.3
70.0
69.3
68.1
69.4
104.5
97.4
93.4
89.1
86.5
83.9
82.1
80.0
78.2
77.5
76.7
75.0
74.0
73.4
72.8
72.5
71.9
71.0
69.8
67.7
66.7
65.6
65.6
76.8
75.8
72.7
74.6
74.8
74.3
73.7
73.3
73.1
73.6
69.5
69.0
69.7
69.8
70.2
71.1
69.5
65.7
67.5
68.3
68.0
69.9
11
285
25
310