Basketball Game	Mini Project 5: Compile Projects & Code the Arrow Keys
In this fifth mini project, you'll import the code from all four previous projects. You'll code the left and right arrow keys to change the value of the angle gauge. You'll also code the up and down arrow keys to change the value of the power gauge.	**Objectives:** • add the NET code • add the GAUGE code • add the ARC code • use getKey to change velocity and angle

Basketball Game Project Overview:

After completing a series of 8 mini-projects, you will have a basketball game similar to the one on the right. The code for mini-projects 1 -4 will be imported into mini-project 5. Projects 6-8 will build upon project 5.

Mini-Project Order:

1. Draw the Background
2. Draw the Net
3. Power Gauge
4. Angle Gauge
5. **Merge Projects & Code the Arrow Keys**
6. Toss the Ball
7. The Game
8. Win the Trophy (and fireworks!)

After Project 6

This Project

1. Create a program named BB

   Import the NET code

   rcl (2nd sto→)
   prgm
   EXEC
   Select NET
   Press the enter key

   Delete the last three lines:

   :Pause
   :BackgroundOff
   :RecallGDB 1

2. Import the GAUGE code
   rcl (2nd sto→)
   prgm
   EXEC
   Select GAUGE
   Press the enter key

   Import the ARC code
   rcl (2nd sto→)
   prgm
   EXEC
   Select NET
   Press the enter key

   Scroll through your code. Make sure ClrDraw is only in the first couple of lines. Delete all other ClrDraw commands you find.

3. You will use the arrow keys to change the values of F the power level and θ the shot angle.

   - If the left arrow key is pressed and θ < 88 you will increase θ by 2.
   - If the right arrow key is pressed and θ > 2 you will decrease θ by 2.
   - If the up arrow key is pressed and F < 100 you will increase F by 2.
   - If the down arrow key is pressed and F > 2 you will decrease F by 2.
   - If the left or right arrow key is pressed you will redraw the angle gauge.
   - If the up or down arrow keys is pressed you will redraw the power gauge.

   All of this code will be embedded inside a loop that will repeat the selection statements until the ENTER key is pressed.

```
:"ARROW KEYS
:0 →K
:While K≠105
:getKey →K
:
: MISSING IF STATEMENTS
:
```

4. Can you code the first two IF statements inside the While statement?

   If the right arrow key is pressed and $\theta > 2$ you will decrease θ by 2.

   If the left arrow key is pressed and $\theta < 88$ you will increase θ by 2.

```
:"ARROW KEYS
:0 →K
:While K≠105
:getKey →K
:
: MISSING IF STATEMENTS
:
```

5. Does your code match the code on the right?

```
PROGRAM:BB
:getKey→K
:If K=26 and θ>2
:Then
:θ-2→θ
:End
:If K=24 and θ<88
:Then
:θ+2→θ
:End
```

Can you code the next two IF statements inside the While statement?

- If the up arrow key is pressed and $F < 100$ you will increase F by 2.
- If the down arrow key is pressed and $F > 2$ you will decrease F by 2.

All of this code will be embedded inside a loop that will repeat the selection statements until the ENTER key is pressed.

```
:"ARROW KEYS
:0 →K
:While K≠105
:getKey →K
:
: MISSING IF STATEMENTS
:
```

6. Does your code match the code on the right?

```
PROGRAM:BB
:End
:If K=25 and F<98
:Then
:F+2→F
:End
:If K=34 and F>2
:Then
:F-2→F
:End
```

If the left or right arrow key is pressed you will redraw the angle gauge. This will be easy, since you will import most of the code from the ARC program.

```
:If K=24 or K = 26
:Then
:
:
rcl ARC
```

Make sure to add an End to complete the If statement.

7. Lastly, you need to update the power gauge.

If the up or down arrow key is pressed you will redraw the power gauge. This will be easy, since you will import most of the code from the GAUGE program.

```
:If K=25 or K = 34
:Then
:
:
rcl GAUGE
```

Make sure to add an End to complete the If statement.

Add one more End statement to complete the while statement

8. Check your lines of code. Make sure the only **ClrDraw** is in the first couple of lines of code. Delete any other **ClrDraws** you find.

Execute and debug your code. The arrow keys should update the values for F the velocity and θ the shot angle.

Teacher Tip:

Students may choose to use different increment values for the arrow keys.

Teacher Tip:

Base Code. Both the power and angle gauge are magenta. Code will have more lines if the student choose to enhance the color choices on the gauges.

```
NORMAL FLOAT AUTO REAL DEGREE MP
EDIT MENU:[alpha][f5]
PROGRAM:BB
:StoreGDB 1
:Degree
:FnOff
:PlotsOff
:1→Xmin
:265→Xmax
:1→Ymin
:165→Ymax
:BackgroundOn Image8
:
:ClrDraw
:randInt(30,120)→Y
:Y-10→Z
:Y-5→S
:Line(245,Y,255,Y,YELLOW)
:Line(245,Z,255,Z,YELLOW)
:Line(240,S,245,Y,YELLOW)
:Line(240,S,245,Z,YELLOW)
:Line(255,Y,260,S,YELLOW)
:Line(255,Z,260,S,YELLOW)
:Y-25→N
:Line(240,Z,250,N,DARKGRAY
)
:Line(245,Z,240,N,DARKGRAY
)
:Line(245,Z,245,N,DARKGRAY
)
:Line(260,Z,260,N,DARKGRAY
)
:Line(260,S,255,N,DARKGRAY
)
:Line(255,Z,250,N,DARKGRAY
)
:Line(250,Z,245,N,DARKGRAY
)
:Line(250,Z,255,N,DARKGRAY
:
:"GUAGE
:20→F
:Line(10,12,10,112,BLACK)
:Line(20,12,20,112,BLACK)
:Line(10,112,20,112,BLACK)

:For(C,1,F)
:Line(12,C+12,19,C+12,MAGE
```

```
NTA)
:End
:For(C,F+1,100)
:Line(12,C+12,19,C+12,WHIT
E)
:End
:
:
:"ARC
:WHITE→C
:30→θ
:For(A,90,θ,-1)
:Line(65,95,65+30*cos(A°),
95+30*sin(A°),C)
:End
:MAGENTA→C
:For(A,θ,0,-1)
:Line(65,95,65+30*cos(A°),
95+30*sin(A°),C)
:End
:
:"ARROW KEYS
:0→K
:While K≠105
:getKey→K
:If K=25 and F<98
:Then
:F+2→F
:End
:If K=34 and F>2
:Then
:F-2→F
:End
:If K=26 and θ>2
:Then
:θ-2→θ
:End
:If K=24 and θ<88
:Then
:θ+2→θ
:End
:"REFRESH
:If K=24 or K=26
:Then
:"ARC
:WHITE→C
:For(A,90,θ,-1)
:Line(65,95,65+30*cos(A°),
95+30*sin(A°),C)
:End
:MAGENTA→C
:For(A,θ,0,-1)
:Line(65,95,65+30*cos(A°),
95+30*sin(A°),C)
```

```
:End
:End
:If K=25 or K=34
:Then
:"GUAGE
:Line(10,12,10,112,BLACK)
:Line(20,12,20,112,BLACK)
:Line(10,112,20,112,BLACK)

:For(C,1,F)
:Line(12,C+12,19,C+12,MAGE
NTA)
:End
:For(C,F+1,99)
:Line(12,C+12,19,C+12,WHIT
E)
:End
:End
:
:End
```