

• type of coordinate axes
graphics software marks ON
• hand-drawn lines
• spirit out points (same width as line segments)

have it takes for F_{n+2} will fit in while F_n wall folds out or time it takes for F_n to fold out again F_{n+2} appeared

• **FINISH OUT:** one side is solid (created from previous two sides), traces out next segment of the motion spiral on the opposite / inside - the gray → solution into remaining sides of cube

$F_{n+2} = F_n + F_{n-2}$

• part boxes walls constructed from dimensions of two missing grey walls
• can roll past themselves, part two boxes
• bigger walls can fold out when they meet with the smaller walls

• **FRONTING DEFINITION** for the links → two boxes more or same size

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• **STUDIOS:** is distinct at THRESHOLD LINE → openness of shading in each character's view as they approach the threshold line, but the character's spiral is not constrained to the bottom of the new box
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RULES OF ENVIRONMENT

- side of box that moves extends solid (black) at all times
- character can only pass through grey lines; point intersect of black lines as solid surfaces
- therefore can only inhabit boxes in which one wall is grey
- boxes that the character may inhabit/pass between at any given time indicate the boxes that will be used to approximate next box
- character may inhabit two boxes at one time
- character must obey downward gravity at all times
- time it takes for a box to be built depends on its size - the bigger the box, the longer it takes
- walls respond to external force only - do not create new boxes of their own accord (without the character's actions, environment would be static)
- threshold force required to initiate creation of new box - one external force is applied to apex for any additional force
- environment is mechanical - exists in characters' gravity, but (unlike character's actions) are not dictated by gravity
- walls are attached with a pull rate of a constant rate (non-Newtonian possible is minimal)

Distinction of double thresholds

Distinction of double thresholds

0 n 100 t

1/clock def
line (400,300) to (400,300+1)
line (300,300) to (300,300+1)

for $0 < \alpha < 90$:

① line (400,300) to (400-100sin(α), 300+100cos(α))
② line (300,300) to (300+100sin(α), 300+100cos(α))
③ line (400,300) to (400, 300+100cos(α))
④ line (300,300) to (300, 300+100cos(α))
⑤ line (400,300) to (400+100sin(α), 300)
⑥ line (300,300) to (300-100sin(α), 300)
⑦ line (400,300) to (400-100sin(α), 300)
⑧ line (300,300) to (300+100sin(α), 300)
⑨ line (400,300) to (400, 300+100cos(α))
⑩ line (300,300) to (300, 300+100cos(α))

0 n 200 t

1/clock def
line (400,300) to (400,100+1)
line (300,300) to (300,100+1)
line (400,300) to (400+1, 100)
line (300,300) to (300+1, 100)

for $0 < \alpha < 90$:

① line (400,300) to (400-200sin(α), 300-200cos(α))
② line (300,300) to (300+200sin(α), 300-200cos(α))
③ line (400,300) to (400, 300+200cos(α))
④ line (300,300) to (300, 300+200cos(α))
⑤ line (400,300) to (400+200sin(α), 300)
⑥ line (300,300) to (300-200sin(α), 300)
⑦ line (400,300) to (400-200sin(α), 300)
⑧ line (300,300) to (300+200sin(α), 300)
⑨ line (400,300) to (400, 300+200cos(α))
⑩ line (300,300) to (300, 300+200cos(α))

0 n 300 t

1/clock def
line (400,300) to (400,200+1)
line (300,300) to (300,200+1)
line (400,300) to (400+1, 200)
line (300,300) to (300+1, 200)

for $0 < \alpha < 90$:

① line (400,300) to (400-300sin(α), 300-300cos(α))
② line (300,300) to (300+300sin(α), 300-300cos(α))
③ line (400,300) to (400, 300+300cos(α))
④ line (300,300) to (300, 300+300cos(α))
⑤ line (400,300) to (400+300sin(α), 300)
⑥ line (300,300) to (300-300sin(α), 300)
⑦ line (400,300) to (400-300sin(α), 300)
⑧ line (300,300) to (300+300sin(α), 300)
⑨ line (400,300) to (400, 300+300cos(α))
⑩ line (300,300) to (300, 300+300cos(α))

0 n 400 t

1/clock def
line (400,300) to (400,100+1)
line (300,300) to (300,100+1)
line (400,300) to (400+1, 100)
line (300,300) to (300+1, 100)

for $0 < \alpha < 90$:

① line (400,300) to (400-400sin(α), 300-400cos(α))
② line (300,300) to (300+400sin(α), 300-400cos(α))
③ line (400,300) to (400, 300+400cos(α))
④ line (300,300) to (300, 300+400cos(α))
⑤ line (400,300) to (400+400sin(α), 300)
⑥ line (300,300) to (300-400sin(α), 300)
⑦ line (400,300) to (400-400sin(α), 300)
⑧ line (300,300) to (300+400sin(α), 300)
⑨ line (400,300) to (400, 300+400cos(α))
⑩ line (300,300) to (300, 300+400cos(α))

$\sum_{n=1}^{\infty} r^n = \frac{r}{1-r}$
 $\sum_{n=1}^{\infty} r^{2n} = \frac{r^2}{1-r^2}$
 $\sum_{n=1}^{\infty} r^{4n} = \frac{r^4}{1-r^4}$
 $\sum_{n=1}^{\infty} r^{6n} = \frac{r^6}{1-r^6}$
 $\sum_{n=1}^{\infty} r^{8n} = \frac{r^8}{1-r^8}$
 $\sum_{n=1}^{\infty} r^{10n} = \frac{r^{10}}{1-r^{10}}$
 $\sum_{n=1}^{\infty} r^{12n} = \frac{r^{12}}{1-r^{12}}$
 $\sum_{n=1}^{\infty} r^{14n} = \frac{r^{14}}{1-r^{14}}$
 $\sum_{n=1}^{\infty} r^{16n} = \frac{r^{16}}{1-r^{16}}$
 $\sum_{n=1}^{\infty} r^{18n} = \frac{r^{18}}{1-r^{18}}$
 $\sum_{n=1}^{\infty} r^{20n} = \frac{r^{20}}{1-r^{20}}$
 $\sum_{n=1}^{\infty} r^{22n} = \frac{r^{22}}{1-r^{22}}$
 $\sum_{n=1}^{\infty} r^{24n} = \frac{r^{24}}{1-r^{24}}$
 $\sum_{n=1}^{\infty} r^{26n} = \frac{r^{26}}{1-r^{26}}$
 $\sum_{n=1}^{\infty} r^{28n} = \frac{r^{28}}{1-r^{28}}$
 $\sum_{n=1}^{\infty} r^{30n} = \frac{r^{30}}{1-r^{30}}$
 $\sum_{n=1}^{\infty} r^{32n} = \frac{r^{32}}{1-r^{32}}$
 $\sum_{n=1}^{\infty} r^{34n} = \frac{r^{34}}{1-r^{34}}$
 $\sum_{n=1}^{\infty} r^{36n} = \frac{r^{36}}{1-r^{36}}$
 $\sum_{n=1}^{\infty} r^{38n} = \frac{r^{38}}{1-r^{38}}$
 $\sum_{n=1}^{\infty} r^{40n} = \frac{r^{40}}{1-r^{40}}$
 $\sum_{n=1}^{\infty} r^{42n} = \frac{r^{42}}{1-r^{42}}$
 $\sum_{n=1}^{\infty} r^{44n} = \frac{r^{44}}{1-r^{44}}$
 $\sum_{n=1}^{\infty} r^{46n} = \frac{r^{46}}{1-r^{46}}$
 $\sum_{n=1}^{\infty} r^{48n} = \frac{r^{48}}{1-r^{48}}$
 $\sum_{n=1}^{\infty} r^{50n} = \frac{r^{50}}{1-r^{50}}$
 $\sum_{n=1}^{\infty} r^{52n} = \frac{r^{52}}{1-r^{52}}$
 $\sum_{n=1}^{\infty} r^{54n} = \frac{r^{54}}{1-r^{54}}$
 $\sum_{n=1}^{\infty} r^{56n} = \frac{r^{56}}{1-r^{56}}$
 $\sum_{n=1}^{\infty} r^{58n} = \frac{r^{58}}{1-r^{58}}$
 $\sum_{n=1}^{\infty} r^{60n} = \frac{r^{60}}{1-r^{60}}$

SCENE 1
CENTER = (425, 550)
BEAM = 4.9

Set line color to pink grey
① Draw non-rotating line from (400,300) to (400,400)
② Draw non-rotating line from (300,300) to (300,400)
Set line color to dark grey
③ Draw rotating vertical line from (400,300) to (400+100cos(α), 300+100sin(α))
④ Draw non-rotating line from (300,300) to (300,400)
⑤ Draw non-rotating line from (400,400) to (300,400)
⑥ Draw non-rotating line from (400,300) to (300,300)

SCENE 2
CENTER = (425 + cos(α)n(4), 550 + sin(α)n(4))
BEAM = 4.9

Set line color to pink grey
① Draw non-rotating line from (400,300) to (400,400)
② Draw non-rotating line from (300,300) to (300,400)
Set line color to dark grey
③ Draw rotating vertical line from (400,300) to (400+100cos(α), 300+100sin(α))
④ Draw rotating vertical line from (300,300) to (300+100cos(α), 300+100sin(α))
⑤ Draw non-rotating line from (400,400) to (300,400)
⑥ Draw non-rotating line from (400,300) to (300,300)
⑦ Draw line from (300,400) to (500+100cos(α), 400+100sin(α)) (for α < 0)
⑧ Draw line from (400,300) to (300,300)

SCENE 3
CENTER = (500, 350-100sin(α))
BEAM = 4.9 dip line

1.25 = 3.25
0 = 0
 $\frac{\Delta}{10} = \frac{3.25}{4} \rightarrow \Delta = 90w$
 $\frac{\Delta}{10} = \frac{3.25}{4} \rightarrow \Delta = 90w + 1.25$

SCENE 5
CENTER = (500, 350-100sin(α))
BEAM = 4.9
Set line color to pink grey
① Draw non-rotating line from (300,300) to (300,400)
② Draw non-rotating line from (400,300) to (400,400)
③ Draw non-rotating line from (300,300) to (400,300)
Set line color to dark grey
④ Draw non-rotating line from (400,300) to (300,300)
⑤ Draw rotating horizontal line from (400,300) to (400+200cos(α), 300-200sin(α))
⑥ Draw non-rotating line from (400,300) to (400,400)
⑦ Draw non-rotating line from (300,300) to (300,400)
⑧ Draw non-rotating line from (400,400) to (300,400)
⑨ Draw non-rotating line from (300,300) to (400,300)
⑩ Draw line from (400,300) to (100+200cos(α), 300-200sin(α)) (for b < 0)

SCENE 4
CENTER = (300-100sin(α), 250)
BEAM = 2.45
Set line color to pink grey
① Draw non-rotating line from (300,300) to (300,400)
② Draw non-rotating line from (300,300) to (400,300)
③ Draw non-rotating line from (400,300) to (400,400)
Set line color to dark grey
④ Draw non-rotating line from (400,300) to (300,300)
⑤ Draw non-rotating line from (400,400) to (300,400)
⑥ Draw non-rotating line from (400,300) to (300,300)
⑦ Draw non-rotating line from (400,400) to (300,400)
⑧ Draw non-rotating line from (300,300) to (400,300)
⑨ Draw non-rotating line from (400,300) to (300,300)
⑩ If $\alpha < 30$, draw line from (300,400) to (300, 500+100cos(α))
⑪ If else, draw line from (300,400) to (300,300)
⑫ Line from (400,400) to (400,100)

SCENE 6
CENTER = (500+400sin(α), 500)
BEAM = 1.9
Set line color to pink grey
① Draw non-rotating line from (400,300) to (400,400)
② Draw non-rotating line from (300,300) to (300,400)
③ Draw non-rotating line from (400,300) to (400,400)
Set line color to dark grey
④ Draw non-rotating line from (400,300) to (300,300)
⑤ Draw non-rotating line from (400,400) to (300,400)
⑥ Draw non-rotating line from (400,300) to (300,300)
⑦ Draw non-rotating line from (400,400) to (300,400)
⑧ Draw non-rotating line from (300,300) to (400,300)
⑨ Draw non-rotating line from (400,300) to (300,300)
⑩ Draw non-rotating line from (400,400) to (300,400)
⑪ Draw non-rotating line from (300,300) to (400,300)
⑫ Draw non-rotating line from (400,300) to (300,300)

SCENE 7
CENTER = (450, 500)
BEAM = 1.05
Set line color to pink grey
① Draw non-rotating line from (400,300) to (400,400)
② Draw non-rotating line from (300,300) to (300,400)
Set line color to dark grey
③ Draw non-rotating line from (400,300) to (300,300)
④ Draw non-rotating line from (400,400) to (300,400)
⑤ Draw non-rotating line from (300,300) to (400,300)
⑥ Draw non-rotating line from (400,300) to (300,300)
⑦ Draw non-rotating line from (400,400) to (300,400)
⑧ Draw non-rotating line from (300,300) to (400,300)
⑨ Draw non-rotating line from (400,300) to (300,300)
⑩ Draw non-rotating line from (400,400) to (300,400)
⑪ Draw non-rotating line from (300,300) to (400,300)
⑫ Draw non-rotating line from (400,300) to (300,300)

SCENE 6
CENTER = (500+400sin(α), 500)
BEAM = 1.9
Set line color to pink grey
① Draw non-rotating line from (400,300) to (400,400)
② Draw non-rotating line from (300,300) to (300,400)
③ Draw non-rotating line from (400,300) to (400,400)
Set line color to dark grey
④ Draw non-rotating line from (400,300) to (300,300)
⑤ Draw non-rotating line from (400,400) to (300,400)
⑥ Draw non-rotating line from (400,300) to (300,300)
⑦ Draw non-rotating line from (400,400) to (300,400)
⑧ Draw non-rotating line from (300,300) to (400,300)
⑨ Draw non-rotating line from (400,300) to (300,300)
⑩ Draw non-rotating line from (400,400) to (300,400)
⑪ Draw non-rotating line from (300,300) to (400,300)
⑫ Draw non-rotating line from (400,300) to (300,300)

• Angles a, b, c, d, and e all take on values in range (0, 90). For any of these angles, the rate at which θ changes from frame-to-frame is 90/n, where n is the number of frames in the animation sequence in which an angle is used. (aka n is the number of frames it takes for an angle to go from 0 to 90). But this rate of change of θ is a base line, & may change ± 90/n depending on how fast a wall is rotating out at any given frame. (n any given frame) So really there should be 90/n additional images of a wall, making from n rotation (n) to full rotation (10) (corresponding to each of the frames in the sequence) at a baseline change in θ per frame of 90/n, with allowance for a change in the baseline rate per frame of ± 90/n.

• The center/axis and the beam factor should change at corresponding rates - should take same number of frames to complete simultaneous changes in focus and beam factor