

8th grade chapter 14 ANIMATION

SURFACE AREA AND VOLUME CUBE & CUBOID

```
from manim import *
from AbstractAnim import AbstractAnim
import cvo
```

```
class SAV(AbstractAnim):
```

```
    def construct(self):
        self.RenderSkillbancLogo()
        self.Introduction()
        self.fadeOutCurrentScene()
        self.cube()
        self.fadeOutCurrentScene()
        self.areacube()
        self.fadeOutCurrentScene()
        self.tsacuboid()
        self.fadeOutCurrentScene()
        self.lsacuboid()
        self.fadeOutCurrentScene()
        self.tsacube()
        self.fadeOutCurrentScene()
        self.lsacube()
        self.fadeOutCurrentScene()
        self.volumecuboid()
        self.fadeOutCurrentScene()
        self.volumecube()
```

```
    def Introduction(self):
        self.setNumberOfCirclePositions(2)
        self.angleChoice = [-TAU/4]
        self.isRandom = False
        p10=cvo.CVO().CreateCVO("SURFACE AREA AND VOLUME", "")
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p11=cvo.CVO().CreateCVO("SHAPES", "")
p11.extendOname(["CUBE", "CUBOID"])
p11.setcircleradius(1.5)
p10.cvolist.append(p11)
self.construct1(p10,p10)

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def cube(self):
    self.setNumberOfCirclePositions(2)
    self.angleChoice = [-TAU/4]
    self.isRandom = False
    p10=cvo.CVO().CreateCVO("CUBOID AND CUBOID", "")
    p11=cvo.CVO().CreateCVO("Operations", "")
    p11.extendOname(["AREA", "VOLUME"])
    p11.setcircleradius(1.5)
    p10.cvolist.append(p11)
    self.construct1(p10,p10)

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```

def areacube(self):
    self.setNumberOfCirclePositions(2)
    self.angleChoice = [-TAU/4]
    self.isRandom = False
    p10=cvo.CVO().CreateCVO("AREA", "")
    p11=cvo.CVO().CreateCVO("AREA TYPES", "")
    p11.extendOname(["LSA", "TSA"])
    p11.setcircleradius(1.5)
    p10.cvolist.append(p11)
    self.construct1(p10,p10)

```

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def tsacuboid(self):
    self.setNumberOfCirclePositions(5)
    #self.angleChoice = [0,0,0]
    self.isRandom = False

```

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    p10=cvo.CVO().CreateCVO("total surface area of
cuboid", "2(lb+lh+bh)").setPosition([-4,0,0])
    p11=cvo.CVO().CreateCVO("h variable ", "6").setPosition([0,2.5,0])
    p12=cvo.CVO().CreateCVO("l variable", "2").setPosition([0,0,0])
    p14=cvo.CVO().CreateCVO("b variable", "4").setPosition([0,-2.5,0])
    p13=cvo.CVO().CreateCVO("TSA OF
CUBOID", "88").setPosition([4,0,0])

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        p10.cvolist.append(p11)
        p10.cvolist.append(p12)
        p10.cvolist.append(p14)
        self.construct1(p10,p10)
        self.construct1(p13,p13)

self.play(Create(CurvedArrow(p11.pos,p13.pos)),Create(CurvedArrow(p
12.pos,p13.pos)),Create(CurvedArrow(p14.pos,p13.pos)))

```

```

def lsacuboid(self):
    self.setNumberOfCirclePositions(5)
    #self.angleChoice = [0,0,0]
    self.isRandom = False

    p10=cvo.CVO().CreateCVO("Lateral surface area of
cuboid", "2h(l+b)").setPosition([-4,0,0])
    p11=cvo.CVO().CreateCVO("h variable ", "6").setPosition([0,2.5,0])
    p12=cvo.CVO().CreateCVO("l variable", "2").setPosition([0,0,0])
    p14=cvo.CVO().CreateCVO("b variable", "4").setPosition([0,-2.5,0])
    p13=cvo.CVO().CreateCVO("LSA OF
CUBOID", "72").setPosition([4,0,0])
    p10.cvolist.append(p11)
    p10.cvolist.append(p12)
    p10.cvolist.append(p14)
    self.construct1(p10,p10)
    self.construct1(p13,p13)

self.play(Create(CurvedArrow(p11.pos,p13.pos)),Create(CurvedArrow(p
12.pos,p13.pos)),Create(CurvedArrow(p14.pos,p13.pos)))

```

```

def tsacube(self):
    self.setNumberOfCirclePositions(4)
    #self.angleChoice = [0,0,0]
    self.isRandom = False

    p10=cvo.CVO().CreateCVO("total surface area of
cube", "6a*a").setPosition([-4,0,0])
    p11=cvo.CVO().CreateCVO("Constant sides", "6").setPosition([0,2,0])
    p12=cvo.CVO().CreateCVO("a variable", "2").setPosition([0,-2,0])
    p13=cvo.CVO().CreateCVO("TSA OF CUBE", "24").setPosition([4,0,0])

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        p10.cvolist.append(p11)
        p10.cvolist.append(p12)
        self.construct1(p10,p10)
        self.construct1(p13,p13)

self.play(Create(CurvedArrow(p11.pos,p13.pos)),Create(CurvedArrow(p
12.pos,p13.pos)))

def Isacube(self):
    self.setNumberOfCirclePositions(4)
    #self.angleChoice = [0,0,0]
    self.isRandom = False

    p10=cvo.CVO().CreateCVO("lateral surface area of
cube", "4a*a").setPosition([-4,0,0])
    p11=cvo.CVO().CreateCVO("Constant sides", "4").setPosition([0,2,0])
    p12=cvo.CVO().CreateCVO("a variable", "2").setPosition([0,-2,0])
    p13=cvo.CVO().CreateCVO("LSA OF CUBE", "16").setPosition([4,0,0])
    p10.cvolist.append(p11)
    p10.cvolist.append(p12)
    self.construct1(p10,p10)
    self.construct1(p13,p13)

self.play(Create(CurvedArrow(p11.pos,p13.pos)),Create(CurvedArrow(p
12.pos,p13.pos)))

def volumecuboid(self):
    self.setNumberOfCirclePositions(5)
    #self.angleChoice = [0,0,0]
    self.isRandom = False

    p10=cvo.CVO().CreateCVO("volume of
cuboid", "l*b*h").setPosition([-4,0,0])
    p11=cvo.CVO().CreateCVO("h variable ", "6").setPosition([0,2.5,0])
    p12=cvo.CVO().CreateCVO("l variable", "2").setPosition([0,0,0])
    p14=cvo.CVO().CreateCVO("b variable", "4").setPosition([0,-2.5,0])
    p13=cvo.CVO().CreateCVO("VOLUME OF
CUBOID", "48").setPosition([4,0,0])
    p10.cvolist.append(p11)
    p10.cvolist.append(p12)

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```
p10.cvolist.append(p14)
self.construct1(p10,p10)
self.construct1(p13,p13)
```

```
self.play(Create(CurvedArrow(p11.pos,p13.pos)),Create(CurvedArrow(p
12.pos,p13.pos)),Create(CurvedArrow(p14.pos,p13.pos)))
```

```
def volumecube(self):
    self.setNumberOfCirclePositions(4)
    #self.angleChoice = [0,0,0]
    self.isRandom = False
```

```
    p10=cvo.CVO().CreateCVO("volume of cube","a*a*a").setPosition([-
4,0,0])
    p12=cvo.CVO().CreateCVO("a variable","2").setPosition([0,0,0])
    p13=cvo.CVO().CreateCVO("VOLUME OF CUBE",
"8").setPosition([4,0,0])
    p10.cvolist.append(p12)
    self.construct1(p10,p10)
    self.construct1(p13,p13)
    self.play(Create(CurvedArrow(p12.pos,p13.pos)))
```

```
if __name__ == "__main__":
    scene = SAV()
    scene.render()
```