A Changing Dimension's Effect on Perim Last	first	Copyright © Bossy Brocci
1) Starting Dimensions & calculation of Perimeter	2) Dou & calc	bling ALL dimensions ulation of Perimeter
		P= 2L+2w = 2(L+w)
w = 2 cm	w = 4 cm	P = 2(10 + 4)
L = 5 cm	L = 10 cm	P = cm
E .	E S	P= 2L+2w = 2(L+w)
		n an
$\frac{L}{L = 3 \text{ cm}}$	L = 6 cm	e par largad 1. Maranan atamina B-amane and le
son le	N2 OT IS	$P = s_1 + s_2 + s_3$
51-5 / ¹ / ₁	51 1	P = + +
$s_2 = 4 \text{ cm}$	$s_2 = 8 \text{ cm}$	P = cm
The states and the second s	n who as a second who as a second	P = 4s
s = 1 cm	s = 2 cm	n 10 - Gringer of Berkelope n Flackov gen eidt nit group gen krytter i h
	1. 1.1 N.2.3.1 2014	n (G
		$P = C = D \pi = 2r \pi$
(r = 1 cm	(r = 2 cm)	

B Changing Dimension's Effect on Area Last	first	Copyright © by Chris Brocci	
 Starting Dimensions & calculation of Area 	 Doubling only ONE dimension & calculation of Area 		
w = 2 cm	w = 2 cm	A = L × w	
L = 5 cm	L = 10 cm		
/ h = 6 cm /	h = 6 cm	A=bxh	
b = 4 cm	/ /		
10 cm	10 cm	$A = \frac{1}{2} (b \times h)$	
base it to	base 1, 80		
		$A = s \times s = s^2$	
s = 1 cm	s = 2 cm		
		$A = (r)^2 \pi$	
(r = 1 cm	$(r = 2 \text{ cm}^{+})$	A = $(2 \text{ cm})^2 \pi$	
		$A = \pi cm^2$	

C	Analysis: Dimension's Effect on Area Last first for the comparison of
1.	What happens to <u>the Area</u> of a Rectangle when you double its Length <u>or</u> width? a)Stays the same b)Doubles c)Cut in half
2.	What happens to the Area of a Parallelogram when you double its Base or Height? a)Stays the same b)Doubles c)Cut in half
3.	What happens to the Area of a Triangle when you double its Base or Height? a)Stays the same b)Doubles c)Cut in half
4.	What happens to the Area of a Square when you double its side?
5	a)Stays the same b)Doubles c)Quadruples (4x bigger)
0.	a)Stays the same b)Doubles c)Quadruples (4x binger)
6.	Using your B-side starting circle and scrap paper, what happens to Area when its radius is Tripled?
	a)3x bigger b)9x bigger
7.	Using your starting B-square and scrap paper, <u>what happens to Area</u> when its side is Tripled? a) 3x bigger b) 9x bigger
8.	Doubling or Tripling a Square's side or Circle's radius does NOT double or triple its Area, because:
	a) The Area of a Square or Circle doesn't have anything squared
9.	b) The Area of a Square or Circle involves <u>Squaring</u> the side or <u>Squaring</u> the radius! What happens to <u>the Area</u> of a Rectangle when its Length <u>or</u> Width is cut in half?
10	ajolays life same bjboubles cjour in hall What happens to the Area of a Darallelogram when its Base or Height is cut in half?
10	a)Stays the same b)Doubles c)Cut in half
11	1. What happens to the Area of a Triangle when its Base or Height is cut in half?
	a)Stays the same b)Doubles c)Cut in half
12	 What happens to <u>the Area</u> of a Square when its side is ½ the original? The Area is: a)1/2 the size b)1/4th the size
13	 B. What happens to the Area of a Circle when its radius is ½ the original? The Area is: a)1/2 the size b)1/4th the size

14. If a Circle's radius or Square's side is 1/3rd the original length, <u>the Area</u> will be:
 a)1/3rd b)1/6th c)1/9th of the original area

	maine)

's Effect on Rec P & A Last	first	Copyright © Bossy Brocci
Starting	Double Starting Length <u>OR</u> Width	Double BOTH Starting Length <u>AND</u> Width
w = 1 cm L = 2 cm	w = 1 cm L = 4 cm	w = 2 cm L = 4 cm
	P = 2(4 cm + 1 cm)	and the second s
	P = cm	
	A = 4 cm x 1 cm	
	A = cm ²	(2.50 P.2.5)
	's Effect on Rec P & A Last Starting W = 1 cm L = 2 cm	StartingDouble Starting Length OR Widthw = 1 cm L = 2 cmw = 1 cm L = 4 cmP = 2(4 cm + 1 cm)P = cm A = 4 cm x 1 cmA = cm ²

When just the Length OR the Width (but not both) is doubled, the <u>Perimeter</u>: a)Doubles b)Less than doubles
 When BOTH the Length and the Width are doubled, the <u>Perimeter</u> also: a)Doubles b)Quadruples

When just the Length OR the Width (but not both) is doubled, the <u>Area</u>:
 When BOTH the Length AND the Width are doubled, the <u>Area</u>:
 a)Doubles
 b)Less than doubles
 b)Quadruples

5. By what factor is <u>Perimeter</u> increased when BOTH the Length and the Width are doubled? a)x2 b)x4 c)x¹/₂
6. By what factor is <u>Area</u> increased when BOTH the Length and the Width are doubled? a)x2 b)x4 c)x¹/₂

7. When BOTH the Length and the Width are halved, the Perimeter is also: A second and a Halved b)Quartered

8. By what factor is <u>Perimeter</u> decreased when BOTH the Length and the Width are <u>halved</u>? a)x¹/₂ b)x¹/₄

 9.
 When BOTH the Length and the Width are <u>halved</u>, the <u>Area</u> is?
 a)Halved
 b)Quartered

 10.
 By what factor is <u>Area</u> decreased when BOTH the Length and the Width are <u>halved</u>?
 a)X¹/₂
 b)X¹/₄

B Changing Dimension	n's Effect on Tri P & A Last	first	Copyright © by Chris Brocci
Dimension Action	Starting	Double Starting Base <u>OR</u> Height	Double BOTH Starting Length <u>AND</u> Width
Figure Sketch	h = 3 cm b = 4 cm	h = 3 cm b = 8 cm	$h = 6 \operatorname{cm} \underbrace{10_{cm}}_{b = 8 \operatorname{cm}}$
Perimeter	40	P = 3 cm + 8 cm + 8.5 cr	n
$[= S_1 + S_2 + S_3]$		P = cm	Ginneheumia
Area		A = ½ 8 cm x 3 cm	
(= ½ b x h)		A = cm ²	and and and a second

 1.
 When just the Base OR the Height (but not both) is doubled, the Perimeter:
 a)Doubles
 b)Less than doubles

 2.
 When BOTH the Base and the Height are doubled, the Perimeter:
 a)Doubles
 b)Less than doubles

When just the Base OR the Height (but not both) is doubled, the <u>Area</u>: a)Doubles b)Less than doubles
 By what factor is <u>Area</u> increased when just the Base or the Height (but not both) is doubled? a)x2 b)x4 c)x⁴/₂

The by what racion is <u>Area</u> increased when just the base of the height (but hot both) is doubled? Ajx2 bjx4 cj

When BOTH the Base and the Height are doubled, the <u>Area</u>: a)Doubles b)Triples c)Quadruples
 By what factor is Area increased when BOTH the Base and the Height are doubled? a)x2 b)x3 c

6. By what factor is <u>Area</u> increased when BOTH the Base and the Height are doubled? a)x2 b)x3 c)x4
7. When just the Base OR the Height (but not both) is halved, the Area is: a)Halved b)Quartered

8. By what factor is <u>Area</u> decreased when just the Base or the Height (but not both) is <u>halved</u>? a) x¹/₂ b) x¹/₄

 9. When BOTH the Base and the Height are <u>halved</u>, the <u>Area</u> is:
 a)Halved
 b)Quartered

 10. By what factor is <u>Area</u> decreased when BOTH the Base and the Height are <u>halved</u>?
 a)X½
 b)X¼

C Changing Dimension's Effect on Square P & A Last

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Dimension Action	Starting		Dou	Double the Side	
Figure Sketch	s = 1 cm		s = 2 cm		
Perimeter (= s + s + s + s = 4s)	(ap 1 + ap)	15 a.A	P	= 4 x 2 cm	
	ano -	C	P =	cm	
Area	1011200		A = :	2 cm x 2 cm	
$(= s \times s = s^2)$			A =	cm ²	

When the side of a square is doubled, the Perimeter: 2. By what factor is Perimeter increased when a side is doubled?

a)x2 b)x4 c)x1/2

first

3. When the side is doubled, the Area actually: a)Triples b)Doubles c)Quadruples

By what factor is the Area increased when a side is doubled? 4. a)x2 **b)**x4 c)X1/2

5. When the side of a square is halved, the Perimeter is: a)Halved b)Doubled

By what factor is Perimeter decreased when a side is halved? **b**)x4 c)x1/2 6. a)x2

7. When the side of a square is halved, the Area is: a)Halved b)Quartered c)Doubled

8. By what factor is Area decreased when a side is halved? a)x2 b)x4 c)x1/2 d)x1/4

9. Now, using scrap-paper, tripling (x3), a side increases its Area by a factor of: a)x3 b)x6 c)x9

Now, using scrap-paper, <u>quadrupling</u> (x4), a side increases its Area by a factor of: a)x4 c)x16 10. b)x8

D Changing Dimension's Effect on Circle	P&A Last	first Copyright © by Chris Brocci
Dimension Action	Starting	Double the Radius
Figure Sketch	r = 1 cm	r = 2 cm
Diameter		D = 2 x 2 cm
(= 2r)		D = cm
Circumference	60 - 49 M	C = 4 cm x π
(= Dπ)		C = π cm
Area (= r ² π)		A = (2 cm x 2 cm) π
		$A = \pi cm^2$

When the radius is doubled, the Diameter & Circumference: a)Triples b)Doubles 1 2. By what factor are Diameter & Circumference increased when the radius is doubled? a)x2 b)x4 c)x1/2

When the radius is doubled, the Area actually: a)Triples b)Doubles 3 c)Quadruples

By what factor is the Area increased when the radius is doubled? 4. a)x2 b)x4 c)x1/2

5. By what factor are Diameter & Circumference decreased when the radius halved? **b)**x4 a)x2 c)x1/2 When the radius is halved, the Area is actually reduced to: a)one-half its size 6. b)one-quarter its size

7. By what factor is the <u>Area reduced</u> when the radius is <u>halved</u>? a)x2 b)x4 c) X1/2 d)x1/4

Doubling the radius: a)Doubles b)Triples 8. c)Quadruples the Area of a Circle Halving the radius: a)Halves b)Thirds c)Quarters the Area of a Circle 9. b)x6 c)x9

10. By what factor would Area increase if radius were tripled (x3)? a)x3

A Changing Dimension's Effect on SA & V of a Sphere Last_

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first

Dimension Action	Starting	Double the Radius (r)
Figure Sketch	· i zzan	- 132 de
Surface Area (= 4r ² π)	SA = 4(1cm) ² π	
	SA = π cm ²	
Volume = (4/3)r ³ π	V = 4/3(1cm) ³ π	Contraction of the second s
	$V = \pi cm^3$	ence in the second second

1. When the radius is doubled, the <u>Surface Area</u>: a)Triples b)Doubles c)Quadruples

2. By what factor does the Surface Area increase when the radius is doubled? a)x2 b)x4 c)x1/2

3. When the radius is halved, the Surface Area is: a)Halved b)Quartered

4. By what factor does the <u>Surface Area</u> decrease when the radius is <u>halved</u>? a)x¹/₂ b)x¹/₄

5. When the radius is doubled, the Volume actually: a)Doubles b)Quadruples c)Octuples

6. By what factor is the <u>Volume</u> increased when the radius is doubled? a)x2 b)x4 c)x8

7. When the radius is halved, the Volume is reduced to: a)one-eighth its size b)one-quarter its size

8. By what factor does the <u>Volume</u> decrease when the radius is <u>halved</u>? **a)**x¹/₆ **b)**x¹/₄

9. Doubling the radius enlarges Volume 8x. <u>Tripling</u> radius would enlarge Volume: a)12x b)27x

10. Doubling radius enlarges Volume 8x; tripling enlarges it 27x; Quadrupling radius enlarges Volume x_____

Dimension Action	Starting	Double Side	Triple Side
Figure Sketch	1 cm	2 cm	3 cm
Surface Area	SA = 6 x (1 cm) ²	218 Y 1 1 200	Series Area (1991
6 x Area of one Face = 6(s ²)	SA = cm^2	inter n	
Volume	V = (1cm) ³	and the second second	Value amilia
= BA x H = $(s x s) x s = s^3$	$V = cm^3$	i factorio	

B Changing Dimension's Effect on SA & V of a Cube Last ______ first _____ Copyright © by Chris Brocci

When the Side of a Cube is <u>doubled</u>, the <u>Surface Area</u>: a)Doubles
 By what factor is <u>Surface Area</u> increased when the side is <u>doubled</u>? a)x¹/₂ b)x² c)x⁴

3. When the Side of a Cube is <u>tripled</u>, the <u>Surface Area</u> is: a)6 times more
4. By what factor is <u>Surface Area</u> increased when the side is <u>tripled</u>? a)x¹/₄ b)x6 c)x9

5. When the Side of a Cube is <u>doubled</u>, the <u>Volume</u>: **a)**Doubles **b)**Quadruples **c)**"Octuples"

6. By what factor is <u>Volume</u> increased when the side is <u>doubled</u>? a)x¹/₂ b)x2 c)x8

When the Side of a Cube is <u>tripled</u>, the <u>Volume</u> is: a)27 times bigger
 By what factor is <u>Volume</u> increased when the side is <u>tripled</u>? a)x3
 b)x6
 c)x9
 d)x27

9. When the Side of a Cube is <u>halved</u>, the <u>Surface Area</u> is decreased by a factor of: a)x¹/₂ b)x¹/₄
10. When the Side of a Cube is <u>halved</u>, the <u>Volume</u> is decreased by a factor of: a)x¹/₂ b)x¹/₄ c)x¹/₄

C Changing Dimension	's Effect on SA & V of Rec Prism Last	first	Copyright © Bossy Brocci
Dimension Action	Starting	Double only 1 Side	Double ALL 3 dimensions
Figure Sketch	3 cm 5 cm	3 cm 1 cm	6 cm 2 cm
Surface Area	SA = 2(3cm) + 2(15cm) + 2(5cm)		
+ 2 x Florr + 2 x Floor	$SA = cm^2$		
Volume = BA x H = L x w x h	V = 5cm x 1cm x 3cm		
	V = cm ³	Nationa V	

1. When one side of a Rectangular Prism is doubled, the Surface Area: a)Doubles b)Less than Doubles 2. By what factor does the <u>Surface Area</u> increase when just <u>one</u> side is doubled? a) $x^{1/2}$ b)x<2 c)x4

3. When ALL 3 sides of a Rectangular Prism are doubled, the Surface Area: a)Doubles b)Quadruples

By what factor does the Surface Area increase when ALL 3 sides are doubled? a)x1/2 4 b)x<2 c)x4

5. When one side of a Rectangular Prism is doubled, the Volume: a)Doubles **b)**Triples b)x2

By what factor does the Volume increase when just one side is doubled? 6. a)x1/2

7. When ALL 3 sides of a Rectangular Prism are doubled, the Volume is: b)Octupled a)Quadrupled

By what factor does the Volume increase when ALL 3 sides are doubled? 8. a)x1/2 **b)**x4 c)x8

When ALL 3 Sides of a Rectangular Prism are halved, the Surface Area is: a)½ what it was b)¼ what it was 9. When ALL 3 Sides of a Rectangular Prism are halved, the Volume is: a)1/4 what it was b)1/6 what it was 10

c)x4

E Changing Dimension's	Effect on SA & V of Cylinder Last	first	Copyright © Bossy Brocci
Dimension Action	Starting	Double just HEIGHT (H)	Double just RADIUS (r)
Figure Sketch			
Surface Area	SA = $2 \times (1 \text{ cm})^2 \pi$ + $2\pi \text{ cm} \times 1 \text{ cm}$		
2(r ² π)+ Dπ(H)	SA = π cm ²	8773	
Volume	$V = (1 cm)^2 \pi x 1 cm$		antipation antipation and
= BA x H = r ² π x H	$V = \pi \text{ cm}^3$	1042 P	

When just the Height is doubled, the Surface Area: a)Doubles b)Less than Doubles 1. 2. When just the Radius is doubled, the Surface Area: a)Doubles b)More than Doubles

When just the Height is doubled, the Volume: a)Doubles b)Less than Doubles

By what factor does the Volume increase when just the Height is doubled? a)x1/2 4. b)x2 clx4

5. When just the Radius is doubled, the Volume: a)Doubles b)Quadruples

3.

6. By what factor does the <u>Volume</u> increase when just the <u>Radius</u> is doubled? $a)x\frac{1}{2}$ b)x2 c)x4

7. If you want a can of Mountain Dew to hold the most soda, you should: a)Double its Height b)Double its Radius If you want your swimming pool to hold the most water, you should: a)Double its Height b)Double its Radius 8.

But if you just want your swimming pool to be DEEPER, then you should double its: a)Height b)Radius 9.

10. Using scrap-paper, by what factor does Volume increase if you double BOTH radius AND Height? a)x6 b)x8

F Changing Dimension's Effect on SA & V of Cone Last		first	Copyright © by Chris Brocci
Dimension Action	Starting	Double just HEIGHT (H)	Double just RADIUS (r)
Figure Sketch	H=4		
Surface Area r ² π + πrL	SA = (3cm)² π + π(3cm x 5 cm)		
	SA = π cm ²		
Volume = ¼ (BA x H) = ¼ ([r²π] x H)	V = ⅓ [(3cm)²π] x 4 cm		
	$V = \pi \text{ cm}^3$		

 When Height is doubled, the Surface Area:
 a)Doubles

 When Radius is doubled, the Surface Area:
 a)Less than Doubles
 1

b)Less than Doubles b)More than Doubles

2. When Height is doubled, the Volume: a)Doubles b)Less than Doubles 3.

By what factor does the Volume increase when Height is doubled? a)x1/2 b)x2 c)x4 4.

5. When Radius is doubled, the Volume: a)Doubles b)Quadruples

By what factor does the Volume increase when Radius is doubled? a)x1/2 blx2 clx4 6.

7. If you want an ice cream cone that hold the most ice cream, you should double its: a)Height b)Radius

If you want a megaphone (loudspeaker) to carry more of your voice, you should double its: a)Height b)Radius 8.

But if you just want your cone-shaped swimming pool to be DEEPER, then double its: a)Height b)Radius 9

Using scrap-paper, by what factor does Volume increase if you double BOTH Radius AND Height? a)x6 b)x8 10.

G Changing Dimension's Effect on SA & V of Sqr Pyr Last		first	Copyright © Bossy Brocci
Dimension Action	Starting	Double just HEIGHT (H)	Double Square Sides
Figure Sketch	Z cm	2 cm	4 cm
Surface Area = s ² + (4 x ½bh)	SA = (2 cm) ² + 4 x (½ 2cm x √10 cm)		
	SA = cm ²		
Volume = ½ (BA x H) = ½ ([s ²] x H)	V = 1/3 (2 cm) ² x 3 cm		
	V = cm ³		

1. When Square Pyramid Height is doubled, the Surface Area: a)Doubles b)Less than Doubles 2. When square base Side is doubled, the Surface Area: a)Less than Doubles b)More than Doubles

3. When Square Pyramid Height is doubled, the Volume: a)Doubles b)Less than Doubles

4. By what factor does the Volume increase when Pyramid Height is doubled? a)x1/2 b)x2 c)x4

5. When square base Side is doubled, the Volume: a)Doubles b)Quadruples

By what factor does the Volume increase when square base Side is doubled? a)x1/2 6. **b**)x2 c)x4

7. If you want your Square Pyramid to hold the most gold, you should double its: a)Height b)Base Sides 8.

If you want to fill your Square Pyramid w/ the most Mtn. Dew, you should double its: a)Height b)Base Sides

But if you want your Square Pyramid to be the TALLEST in the kingdom, then double its: a)Height b)Base Sides 9 Using scrap-paper, by what factor does Volume increase if you double BOTH Height AND Sides? a)x6 b)x8 10.