Session One

|  |  |
| --- | --- |
| Penny | One  |
| Nickel | Five |
| Dime | Ten |
| Quarter | Twenty-Five |

Patterns and Relationships

|  |  |
| --- | --- |
| Girl | Boy |
| Top | Bottom |
| First | Last |
| Big | Small |

|  |  |
| --- | --- |
| Carpenter | Hammer |
| Teacher | Books |
| Author | Computer |
| Doctor  | Stethoscope |
| Secretary | Keyboard |

|  |  |
| --- | --- |
| 3 | 5 |
| 8 | 10 |
| 0 | 2 |
| 10 | 12 |
| 4 | 6 |

|  |  |
| --- | --- |
| 5 | 10 |
| 3 | 6 |
| 10 | 20 |
| 100 | 200 |

Piles of Cubes 1

|  |  |
| --- | --- |
| P=Pile Number | C=Number of cubes |
| 1 | 4 |
| 2 | 7 |
| 3 | 10 |
| 4 | 13 |
| 5 | 16 |
| 10 | 3x10+1=31 |

 C=3p+1

Menu of Pattern Activities

1. Toothpick Houses

|  |  |
| --- | --- |
| S=Story numbers | T=Number of toothpicks |
| 1 | 6 |
| 2 | 9 |
| 3 | 12 |
| 35 | 3x35+3=108 |

T=3s+3

2.Flying V’s and W’s

|  |  |
| --- | --- |
| P= Pattern Numbers  | B=Number of birds |
| 1 | 5 |
| 2 | 9 |
| 3 | 13 |
| 10 | 2x10+1=21 |

B=2p+1

|  |  |
| --- | --- |
| P=Pattern Numbers | A=Number of airplanes |
| 1 | 5 |
| 2 | 9 |
| 3 | 13 |
| 10 | 4x10+1=41 |

A=4p+1

|  |  |
| --- | --- |
| Total number of lines | Number of Diagonals |
| 3x0=0 | 0÷2=0 |
| 4x1=4 | 4÷2=2 |
| 5x2=10 | 10÷2=5 |
| 6x3=18 | 18÷2=9 |
| 7x4=28 | 28÷2=14 |
| 8x5=40 | 40÷2=20 |
| 9x6=54 | 54÷2=27 |
| 10x7=70 | 70÷2=35 |

3.Diagonals of Polygons

|  |  |
| --- | --- |
| S=Number of sides/ Corners | D=Number of Diagonals from each corner |
| 3 | 0 |
| 4 | 1 |
| 5 | 2 |
| 6 | 3 |
| 7 | 4 |
| 8 | 5 |
| 9 | 6 |
| 10 | 7 |

D= $\frac{s\left(s-3\right)}{2}$

1. Cut-Cut

|  |  |
| --- | --- |
| C=Number of Cuts | P=Number of pieces |
| 1 | 2 |
| 2 | 4 |
| 3 | 8 |
| 5 | 32 |
| 8 | 256 |

P=2c

Session Two

Piles of Cubes 2

|  |  |
| --- | --- |
| P=Pile Number  | C=Number of cubes |
| 1 | 5 |
| 2 | 8 |
| 3 | 11 |
| 4 | 14 |
| 5 | 17 |
| 6 | 20 |
| 10 | 3x10+2=32 |
| 15 | 3x15+2=47 |
| 20 | 3x20+2=62 |
| 100 | 3x10+2=302 |

C=3p+2

Triangles

|  |  |
| --- | --- |
| T=Number of Triangle | P=perimeter |
| 1 | 3 |
| 2 | 4 |
| 3 | 5 |
| 4 | 6 |
| 5 | 7 |
| 6 | 8 |
| T | T+2 |

Hexagons

|  |  |
| --- | --- |
| H=Number of Hexagons | P=Perimeter |
| 1 | 6 |
| 2 | 10 |
| 3 | 14 |
| 4 | 18 |
| 5 | 22 |
| 6 | 26 |
| H | 4H+2 |

Session Three

Writing Equations

1. 3 days=72 hours.

H=24 x d

1. 5 quarters= 125 pennies

P=25 x q

1. 35 days=5week

W=d ÷ 2

1. 36 month = 3 years

Y= m ÷ 12

Equations and Problem Solving.

|  |  |
| --- | --- |
| S=Number of squares | M= Number of matchsticks |
| 1 | 4 |
| 2 | 7 |
| 3 | 10 |
| 4 | 13 |
| 5 | 16 |
| 60 | 3x60+1=181 |

M=3s+1

2.Banquit Table

|  |  |
| --- | --- |
| T=Number of tables | P=Number of people |
| 1 | 5 |
| 2 | 8 |
| 3 | 11 |
| 4 | 14 |
| 10 | 3x10+2=32 |
| 50 | 3x50+2=152 |

P= 3t+2

3.Growing Squares

|  |  |
| --- | --- |
| S=Number of squares | P=Perimeter |
| 1 | 4 |
| 2 | 8 |
| 3 | 12 |
| 4 | 16 |
| 5 | 20 |

P= 4xS

4.Twelve days of Christmas

|  |  |
| --- | --- |
| D=Days | G=Number of Gifts |
| 1 | 1 |
| 2 | 3 |
| 3 | 6 |
| 4 | 10 |
| 5 | 15 |
| 6 | 21 |
| 7 | 28 |
| 8 | 36 |
| 9 | 45 |
| 10 | 55 |
| 11 | 66 |
| 12 | 78 |

G= $\frac{d(+1)}{2}$

5. Handshakes

|  |  |
| --- | --- |
| P=Number of Peoples | H=Number of handshakes |
| 1 | 0 |
| 2 | 1 |
| 3 | 3 |
| 4 | 6 |
| 5 | 10 |
| 6 | 15 |
| 100 | 100(gg)/2=4950 |
| P | $$\frac{p\left(p-1\right)}{2}$$ |

6.Tower of offices

|  |  |
| --- | --- |
| F= Number of floors | O=Number of Offices |
| 1 | 1 |
| 2 | 3 |
| 3 | 6 |
| 4 | 10 |
| 5 | 15 |
| 6 | 21 |
| 7 | 28 |
| 8 | 36 |
| 22 | (22)(23)/2=253 |

H=$\frac{f(f+1)}{2}$

Its not possible to have exactly 34 offices.

Session Four

Money Exchange Game

1. Two Coins on each side

-p,n,n,p,p,n,n,p

1. Three coins on each side

-p,n,n,p,p,p,n,n,n,p,p,p,n,n,p

1. Four coins on each side

-p,n,n,p,p,p,n,n,n,n,p,p,p,p,

n,n,n,n,p,p,p,n,n,p

Tables and Expression Cards

|  |  |
| --- | --- |
| B |  |
| 4 | 3 |
| 7 | 6 |
| 1 | 0 |
| X | x-1 |

|  |  |
| --- | --- |
| C |  |
| 2 | 2x5 |
| 5 | 5x5 |
| 7x5 | 8 |
| G | G+0.5 |

|  |  |
| --- | --- |
| A |  |
| 3 | 5 |
| 5 | 7 |
| 11 | 13 |
| A | A+2 |

|  |  |
| --- | --- |
| D |  |
| 10 | 40 |
| 25 | 100 |
| 3 | 12 |
| U | 4xU |

|  |  |
| --- | --- |
| E |  |
| 6 | 3 |
| 2 | 1 |
| 10 | 5 |
| 14 | 7 |
| M | M÷2 |

|  |  |
| --- | --- |
| F |  |
| 4 | G |
| 8 | 17 |
| 2 | 5 |
| 10 | 21 |
| 1s | 2s +1 |

|  |  |
| --- | --- |
| G  |  |
| 6 | 2 |
| 12 | 4 |
| G | 3 |
| M | M÷3 |

|  |  |
| --- | --- |
| H |  |
| 2 | 4 |
| 6 | 36 |
| 3 | G  |
| H | H2 |

|  |  |
| --- | --- |
| I |  |
| 4 | G  |
| 5 | 10 |
| 6 | 11 |
| g | N+5 |

|  |  |
| --- | --- |
| J  |  |
| 100 | 10 |
| 40 | 4 |
| 15 | 1.5 |
|  T | T÷10 |

|  |  |
| --- | --- |
| K |  |
| 3 | 5 |
| 4 | 7 |
| 5 | G  |
| B | 2b-1 |

|  |  |
| --- | --- |
| L |  |
| 1 | 11 |
| 3 | 13 |
| -1 | G |
| 5 | 15 |
| K | K+10 |

At home with expressions

|  |  |
| --- | --- |
|  |  |
| 1 | 5 |
| 2 | 10 |
| 3 | 15 |
| 4 | 20 |
| 5 | 25 |
| N  | 5xn |

|  |  |
| --- | --- |
|  |  |
| 3 | 5 |
| 4 | 6 |
| 8 | 10 |
| 11 | 13 |
| 16 | 18 |
| M  | M+2 |

|  |  |
| --- | --- |
|  |  |
| 4 | G |
| 7 | 15 |
| 10 | 31 |
| 20 | 41 |
|  T  | 2t+1\* |

|  |  |
| --- | --- |
|  |  |
| 2 | 1 |
| 4 | 2 |
| 5 | 2.5 |
| 8 | 4 |
| 24 | 12 |
| S | S÷2 |

Session Five-Seven

The bathtub graphs

Description may vary

What do they tell you?

Description may vary

From graphs to tables to equations

|  |  |
| --- | --- |
| Number of workdays | Of money earned |
| 2 | 50 |
| 4 | 100 |
| 5 | 125 |
| 6 | 150 |
| 7 | 175 |
| 10 | 250 |

|  |  |
| --- | --- |
| Number of people on trip | Total of cost of trip |
| 1 | 130 |
| 2 | 140 |
| 3 | 150 |
| 4 | 160 |
| 6 | 180 |
| 8 | 200 |
| 100 | 220 |
| 11 | 230 |

Session Eight

Bags of Gold

1. 4b=56 (÷4)

B=14oz

1. B+36=80

B=44oz

1. 10b+20=100

 -20 -20

10b=80 (÷10)

B=8 oz

1. 2b+18=3b

-2b -2b

18=b=18oz

1. 8b + 65 = 3b + 120

-3b -65 -3b -65

5b=55 (÷5)

B=11 oz

1. 5b+12=5b+15

-5b -5b

12=15=false

The side do not balance.

1. 12b+8=12b+8

-12b -12b

8=8=true

The sides ALWAYS balance no matter the amount of gold in each bag.