# **Biopolymers: Building Blocks of Life Worksheet**

## **Building Polymers Activity: Data Tables**

Activity 1 Data Table: Building Straight-Chain Polymers         Chain Length Data       Value       Unit         Average (mean)       Monomers/chain         Minimum       Monomers         Maximum       Monomers         Median       Monomers         Calculate the mean by this formula,       Monomers         Calculate the mean by this formula,       Mean = $\frac{Total number of monomers in all chains}{Number of chains} = \frac{monomers}{monomers}$ Activity 2 Data Table: Building 2-D Polymers with Bends         Number of Chains       0 bends       1 bend       2 bends       3 bends       >3 bends         Trimer (3-long)       Image: Colored and the state of the s	Student Name			Class/Period	Date	<u>.</u>
Chain Length Data       Value       Unit         Average (mean)       Monomers/chain         Minimum       Monomers         Maximum       Monomers         Median       Monomers         Calculate the mean by this formula,       Monomers         Calculate the mean by this formula,       Monomers         Mean =       Total number of monomers in all chains Number of chains         Activity 2 Data Table: Building 2-D Polymers with Bends         Number of Chains       0 bends         Dimer (2-long)       Image: Chains         Trimer (3-long)       Image: Chains         Pentamer (5-long)       Image: Chains         Hexamer (6-long)       Image: Chains         Heptamer (7-long)       Image: Chains         Octamer (8-long)       Image: Chains         Pentamer (7-long)       Image: Chains         Octamer (8-long)       Image: Chains         Decamer (10-long)       Image: Chains	Activity 1 Data Tab	ole: Building St	traight-Chain	Polymers		
Average (mean)       Monomers/chain         Minimum       Monomers         Maximum       Monomers         Median       Monomers         Median       Monomers         Calculate the mean by this formula,       Monomers         Mean =       Total number of monomers in all chains Number of chains       = monomers         Activity 2 Data Table: Building 2-D Polymers with Bends       = chains         Number of Chains       0 bends       1 bend       2 bends       3 bends       >3 bends         Dimer (2-long)       Image: Second Secon	Chain Length Data		Value	Unit		
Minimum       Monomers         Maximum       Monomers         Median       Monomers         Median       Monomers         Calculate the mean by this formula,       Monomers in all chains $Mean = \frac{Total number of monomers in all chains}{Number of chains} = \frac{monomers}{chains}$ Activity 2 Data Table: Building 2-D Polymers with Bends         Number of Chains       0 bends       1 bend       2 bends       3 bends       >3 bends         Dimer (2-long)       Image: Comparison of the state of the	Average (mean)			Monomers/chain		
Maximum       Monomers         Median       Monomers         Median       Monomers         Calculate the mean by this formula, <ul> <li>Mean = Total number of monomers in all chains Number of chains</li> <li>= chains</li> </ul> Activity 2 Data Table: Building 2-D Polymers with Bends         Number of Chains       0 bends       1 bend       2 bends       3 bends       >3 bends         Dimer (2-long)       Image: State St	Minimum			Monomers		
Median       Monomers         Median         Total number of monomers in all chains Number of chains         Mean = Total number of monomers in all chains Number of chains         Activity 2 Data Table: Building 2-D Polymers with Bends         Number of Chains       0 bends       1 bend       2 bends       3 bends       >3 bends         Dimer (2-long)       1       1       1       1       1         Trimer (3-long)       1       1       1       1       1         Pentamer (4-long)       1       1       1       1       1         Heptamer (7-long)       1	Maximum			Monomers		
Calculate the mean by this formula, $Mean = \frac{Total number of monomers in all chains}{Number of chains} = \frac{monomers}{monomers}$ Activity 2 Data Table: Building 2-D Polymers with Bends         Number of Chains       0 bends       1 bend       2 bends       3 bends       >3 bends         Dimer (2-long)       1       1       1       1       1         Trimer (3-long)       1       1       1       1       1         Pentamer (5-long)       1       1       1       1       1         Heptamer (7-long)       1       1       1       1       1         Octamer (8-long)       1       1       1       1       1       1         Decamer (10-long)       1	Median		Monomers			
Number of Chains       0 bends       1 bend       2 bends       3 bends       >3 bends         Dimer (2-long)       1	Calculate the mean by this formula, $Mean = \frac{Total  number  of  mono}{Number  of}$			ers in all chains ains	monomers chains	
Number of entities     District of entities     District of entities       Dimer (2-long)     Image: Control of entities     Image: Control of entities       Trimer (3-long)     Image: Control of entities     Image: Control of entities       Tetramer (4-long)     Image: Control of entities     Image: Control of entities       Pentamer (5-long)     Image: Control of entities     Image: Control of entities       Heptamer (6-long)     Image: Control of entities     Image: Control of entities       Octamer (8-long)     Image: Control of entities     Image: Control of entities       Nonamer (9-long)     Image: Control of entities     Image: Control of entities       Polymer (210-long)     Image: Control of entities     Image: Control of entities	Activity 2 Data Tab	ole: Building 2	-D Polymers w	vith Bends	3 bends	>3 hends
Trimer (3-long)       Image: Constraint of the second	Dimer (2-long)	o benus			U DENGU	
Tetramer (4-long)       Image: Constraint of the second seco	Trimer (3-long)					
Pentamer (5-long)       Image: Constraint of the second seco	Tetramer (4-long)					
Hexamer (6-long)       Image: Constraint of the second secon	Pentamer (5-long)					
Heptamer (7-long)       Image: Constraint of the second seco	Hexamer (6-long)					
Octamer (8-long)     Image: Constraint of the second	Heptamer (7-long)					
Nonamer (9-long)	Octamer (8-long)					
Decamer (10-long)       Polymer (>10-long)	Nonamer (9-long)					<u> </u>
Polymer (>10-long)	Decamer (10-long)					
	Polymer (>10-long)					

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### **Building Polymers Activity: Data Analysis and Discussion**

#### Questions

- 1. In your data, do the median and mean have the same value? Why do you think that happened?
- 2. List three differences between the chains you made in Activity 1 and Activity 2.

3. Based on your data, is the median or mean the most important number to describe your collection of chains? Explain your answer.