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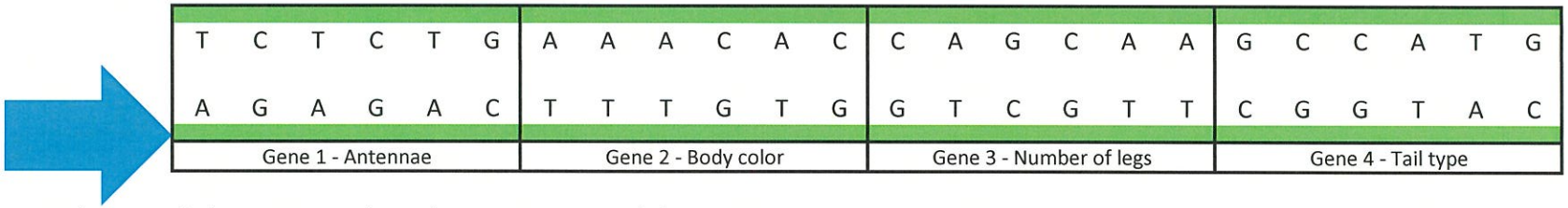
BUG BABY #1 - DNA TEMPLATE



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A	G	A	G	A	C	T	T	T	G	T	G	G	T	C	G	T	T	C	G	G	T	A	C
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Remember to use the lower DNA strand to make your RNA transcript below

BUG BABY #1 - RNA TRANSCRIPT

mRNA																							
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Now copy the same mRNA transcript above to the Codon row below

BUG BABY #1 - CODONS AND AMINO ACIDS

Amino Acid																							
Codon (mRNA)																							
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Use the Codon chart to convert mRNA codons to Amino Acids, and then the Protein Decoder to convert Amino Acid pairs into phenotypic traits

BUG BABY #1 - AMINO ACIDS TO TRAITS

Amino Acid								
Protein/Trait								
Gene 1 - Antennae		Gene 2 - Body color		Gene 3 - Number of legs		Gene 4 - Tail type		

KEY

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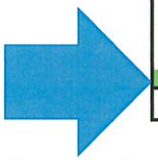
BUG BABY #1 - DNA TEMPLATE



T C T C T G	A A A C A C	C A G C A A	G C C A T G
A G A G A C	T T T G T G	G T C G T T	C G G T A C
Gene 1 - Antennae	Gene 2 - Body color	Gene 3 - Number of legs	Gene 4 - Tail type

Remember to use the lower DNA strand to make your RNA transcript below

BUG BABY #1 - RNA TRANSCRIPT

mRNA	U C U C U G	A A A C A C	C A G C A A	G C C A U G
	Gene 1 - Antennae	Gene 2 - Body color	Gene 3 - Number of legs	Gene 4 - Tail type

Now copy the same mRNA transcript above to the Codon row below

BUG BABY #1 - CODONS AND AMINO ACIDS

Amino Acid	SERINE	LEUCINE	LYSINE	HISTIDINE	GLUTAMINE	GLUTAMINE	ALANINE	METHIONINE
Codon	U C U	C U G	A A A	C A C	C A G	C A A	G C C	A U G
mRNA Strand								
	Gene 1 - Antennae		Gene 2 - Body color		Gene 3 - Number of legs		Gene 4 - Tail type	

Use the Codon chart to convert mRNA codons to Amino Acids, and then the Protein Decoder to convert Amino Acid pairs into phenotypic traits

BUG BABY #1 - AMINO ACIDS TO TRAITS

Amino Acid	SERINE	LEUCINE	LYSINE	HISTIDINE	GLUTAMINE	GLUTAMINE	ALANINE	METHIONINE
Protein/Trait	Straight Antennae		All White Body and Head		Four Legs		Straight Tail	
	Gene 1 - Antennae		Gene 2 - Body color		Gene 3 - Number of legs		Gene 4 - Tail type	

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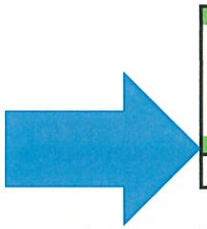
BUG BABY #2 - DNA TEMPLATE



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A	G	T	G	G	A	C	C	A	C	A	T	G	T	C	A	T	A	C	G	G	A	A	C
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Remember to use the lower DNA strand to make your RNA transcript below

BUG BABY #2 - RNA TRANSCRIPT

mRNA																							
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Now copy the same mRNA transcript above to the Codon row below

BUG BABY #2 - CODONS AND AMINO ACIDS

Amino Acid																							
Codon (mRNA)																							
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Use the Codon chart to convert mRNA codons to Amino Acids, and then the Protein Decoder to convert Amino Acid pairs into phenotypic traits

BUG BABY #2 - AMINO ACIDS TO TRAITS

Amino Acid								
Protein/Trait								
Gene 1 - Antennae		Gene 2 - Body color		Gene 3 - Number of legs		Gene 4 - Tail type		

KEY

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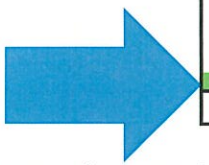
BUG BABY #2 - DNA TEMPLATE



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A	G	T	G	G	A	C	C	A	C	A	T	G	T	C	A	T	A	C	G	G	A	A	C
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Remember to use the lower DNA strand to make your RNA transcript below

BUG BABY #2 - mRNA TRANSCRIPT

mRNA	U	C	A	C	C	U	G	G	U	G	U	A	C	A	G	U	A	U	G	C	C	U	U	G
	Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Now copy the same mRNA transcript above to the Codon row below

BUG BABY #2 - CODONS AND AMINO ACIDS

Amino Acid	SERINE			PROLINE			GLYCINE			VALINE			GLUTAMINE			TYROSINE			ALANINE			LEUCINE		
Codon (mRNA)	U	C	A	C	C	U	G	G	U	G	U	A	C	A	G	U	A	U	G	C	C	U	U	G
	Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Use the Codon chart to convert mRNA codons to Amino Acids, and then the Protein Decoder to convert Amino Acid pairs into phenotypic traits

BUG BABY #2 - AMINO ACIDS TO TRAITS

Amino Acid	SERINE		PROLINE		GLYCINE		VALINE		GLUTAMINE		TYROSINE		ALANINE		LEUCINE	
Protein/Trait	Curly Antennae				All Pink Body and Head				Six Legs				Curly Tail			
	Gene 1 - Antennae				Gene 2 - Body color				Gene 3 - Number of legs				Gene 4 - Tail type			

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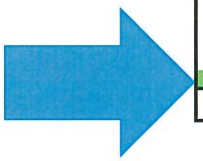
BUG BABY #3 - DNA TEMPLATE



T	C	T	T	A	G	A	A	G	G	T	C	C	A	G	T	A	C	A	T	G	A	T	G
A	G	A	A	T	C	T	T	C	C	A	G	G	T	C	A	T	G	T	A	C	T	A	C
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Remember to use the lower DNA strand to make your RNA transcript below

BUG BABY #3 - RNA TRANSCRIPT

mRNA																							
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Now copy the same mRNA transcript above to the Codon row below

BUG BABY #3 - CODONS AND AMINO ACIDS

Amino Acid																							
Codon (mRNA)																							
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Use the Codon chart to convert mRNA codons to Amino Acids, and then the Protein Decoder to convert Amino Acid pairs into phenotypic traits

BUG BABY #3 - AMINO ACIDS TO TRAITS

Amino Acid								
Protein/Trait								
Gene 1 - Antennae		Gene 2 - Body color		Gene 3 - Number of legs		Gene 4 - Tail type		

KEY

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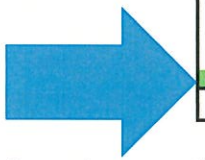
BUG BABY #3 - DNA TEMPLATE



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A	G	A	A	T	C	T	T	C	C	A	G	G	T	C	A	T	G	T	A	C	T	A	C
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Remember to use the lower DNA strand to make your RNA transcript below

BUG BABY #3 - mRNA TRANSCRIPT

mRNA	U	C	U	U	A	G	A	A	G	G	U	C	C	A	G	U	A	C	A	U	G	A	U	G
	Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Now copy the same mRNA transcript above to the Codon row below

BUG BABY #3 - CODONS AND AMINO ACIDS

Amino Acid	SERINE			STOP			LYSINE			VALINE			GLUTAMINE			TYROSINE			METHIONINE			METHIONINE		
Codon (mRNA)	U	C	U	U	A	G	A	A	G	G	U	C	C	A	G	U	A	C	A	U	G	A	U	G
	Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Use the Codon chart to convert mRNA codons to Amino Acids, and then the Protein Decoder to convert Amino Acid pairs into phenotypic traits

BUG BABY #3 - AMINO ACIDS TO TRAITS

Amino Acid	SERINE	STOP	LYSINE	VALINE	GLUTAMINE	TYROSINE	METHIONINE	METHIONINE
Protein/Trait	No Antennae		All white body and head with pink middle segment		Six Legs		Forked Tail	
	Gene 1 - Antennae		Gene 2 - Body color		Gene 3 - Number of legs		Gene 4 - Tail type	

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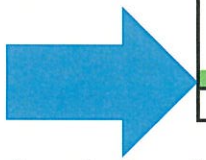
BUG BABY #4 - DNA TEMPLATE



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A	G	A	A	T	C	T	C	C	A	C	A	G	T	C	G	T	T	C	G	G	A	T	T
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Remember to use the lower DNA strand to make your RNA transcript below

BUG BABY #4 - RNA TRANSCRIPT

mRNA																							
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Now copy the same mRNA transcript above to the Codon row below

BUG BABY #4 - CODONS AND AMINO ACIDS

Amino Acid																							
Codon (mRNA)																							
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Use the Codon chart to convert mRNA codons to Amino Acids, and then the Protein Decoder to convert Amino Acid pairs into phenotypic traits

BUG BABY #4 - AMINO ACIDS TO TRAITS

Amino Acid																							
Protein/Trait																							
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

KEY

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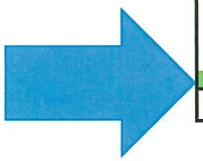
BUG BABY #4 - DNA TEMPLATE



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A	G	A	A	T	C	T	C	C	A	C	A	G	T	C	G	T	T	C	G	G	A	T	T
Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Remember to use the lower DNA strand to make your RNA transcript below

BUG BABY #4 - mRNA TRANSCRIPT

mRNA	U	C	U	U	A	G	A	G	G	U	G	U	C	A	G	C	A	A	G	C	C	U	A	A
	Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Now copy the same mRNA transcript above to the Codon row below

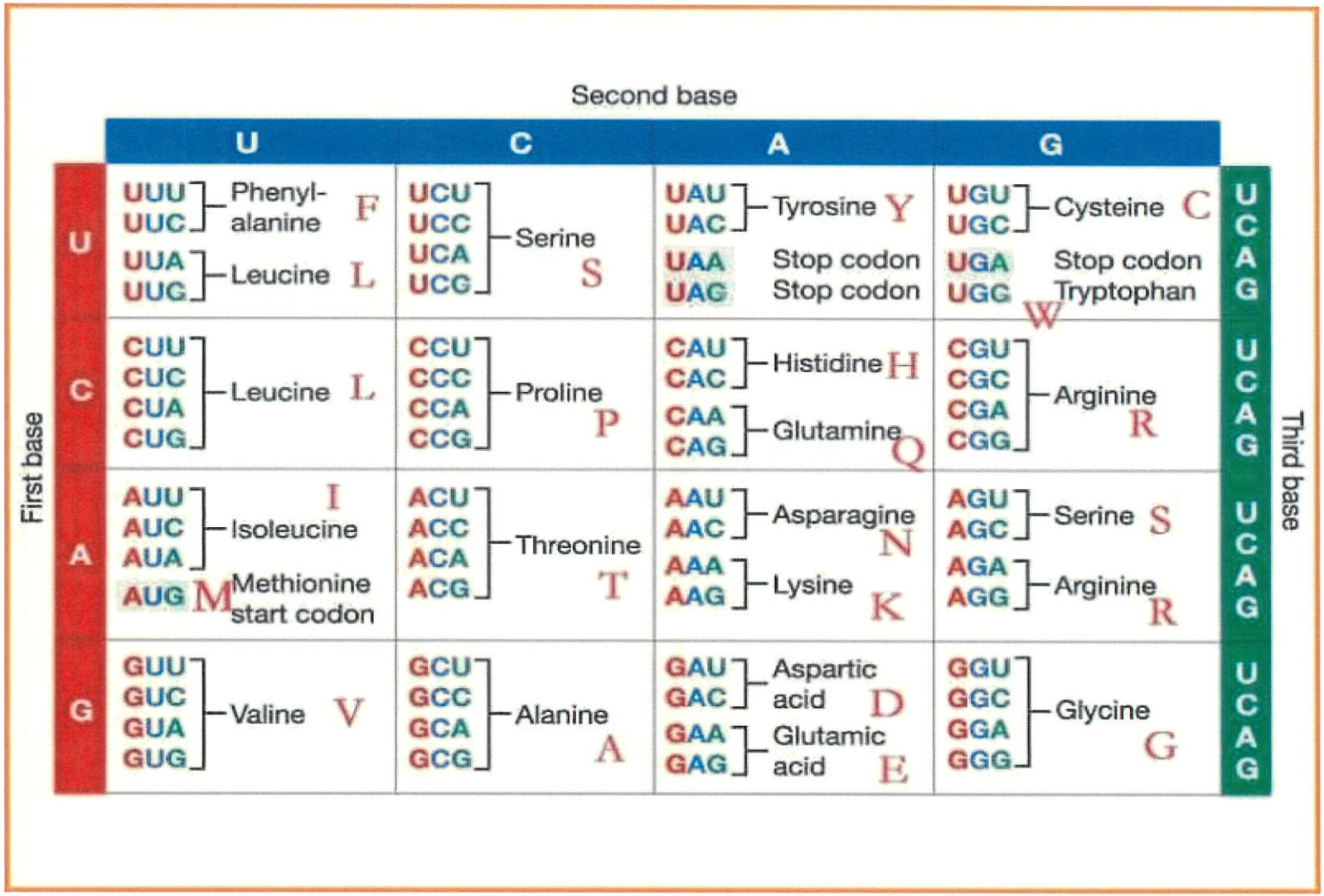
BUG BABY #4 - CODONS AND AMINO ACIDS

Amino Acid	SERINE			STOP			ARGININE			CYSTEINE			GLUTAMINE			GLUTAMINE			ALANINE			STOP		
Codon (mRNA)	U	C	U	U	A	G	A	G	G	U	G	U	C	A	G	C	A	A	G	C	C	U	A	A
	Gene 1 - Antennae						Gene 2 - Body color						Gene 3 - Number of legs						Gene 4 - Tail type					

Use the Codon chart to convert mRNA codons to Amino Acids, and then the Protein Decoder to convert Amino Acid pairs into phenotypic traits

BUG BABY #4 - AMINO ACIDS TO TRAITS

Amino Acid	SERINE	STOP	ARGININE	CYSTEINE	GLUTAMINE	GLUTAMINE	ALANINE	STOP
Protein/Trait	No Antennae		All white body and pink head		Four Legs		No Tail	
	Gene 1 - Antennae		Gene 2 - Body color		Gene 3 - Number of legs		Gene 4 - Tail type	


Second base
U
C
A
G
First base
Third base
UUU Phenyl-alanine F
UUC
UUA Leucine L
UUG
UCU Serine S
UCC
UCA
UCG
UAU Tyrosine Y
UAC
UAA Stop codon
UAG Stop codon
UGU Cysteine C
UGC
UGA Stop codon
UGG Tryptophan W
CUU Leucine L
CUC
CUA
CUG
CCU Proline P
CCC
CCA
CCG
CAU Histidine H
CAC
CAA Glutamine Q
CAG
CGU Arginine R
CGC
CGA
CGG
AUU Isoleucine I
AUC
AUA
AUG Methionine start codon M
ACU Threonine T
ACC
ACA
ACG
AAU Asparagine N
AAC
AAA Lysine K
AAG
AGU Serine S
AGC
AGA Arginine R
AGG
GUU Valine V
GUC
GUA
GUG
GCU Alanine A
GCC
GCA
GCG
GAU Aspartic acid D
GAC
GAA Glutamic acid E
GAG
GGU Glycine G
GGC
GGA
GGG

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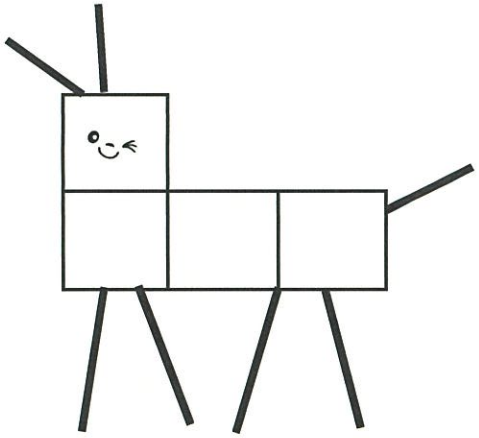
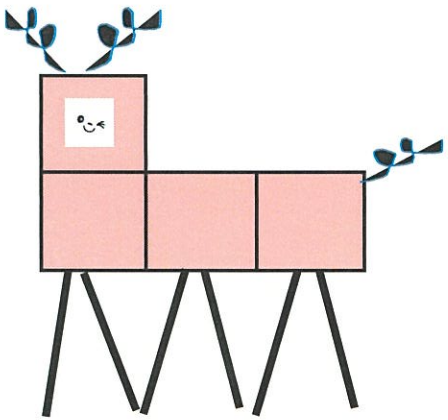
Protein Decoder

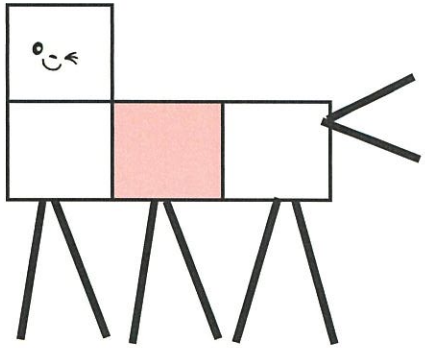
Amino Acids	**Trait**
Serine + Leucine	Straight antennae
Serine + Proline	Curly antennae
Serine + Stop	No antennae
Lysine + Histidine	White body and head
Glycine + Valine	Pink body and head
Lysine + Valine	White body and head, pink middle segment
Arginine + Cysteine	White body, pink head
Glutamine + Glutamine	Four legs
Glutamine + Tyrosine	Six legs
Alanine + Methionine	Straight tail
Alanine + Leucine	Curly tail
Methionine + Methionine	Forked tail
Alanine + Stop	No tail



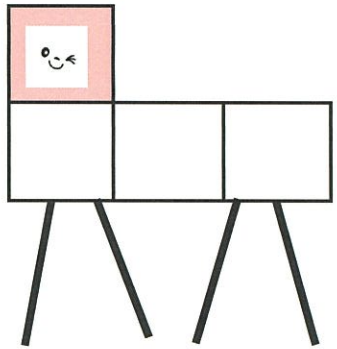
Baby 1 phenotype



Baby 2 Phenotype



Baby 3 Phenotype



Baby 4 Phenotype

<u>Suppplies to order:</u>

1) Bags of mixed white and pink marshmallows - body segments
2) Black pipe cleaners - tail pieces
3) Box of thumbtacks - legs
4) Sharpie markers - face markings
5) Package of toothpicks - hold together body segments

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