N	AME	<b>:</b>					PER	RIOD:	DATE:
L	AB P	ARTI	NERS:						LAB #9
				R	ROCK IDE	ENTIFIC	ATION		
*	* <b>NO</b> ′	TE TO						ONE BIG LAND 9C)**	AB OR DIVIDED
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Y	ou wi				known roc	ks based o	n their ph	ysical chara	cteristics using the
		<b>RIAI</b> ample		n Science R	egents Ref	erence Ta	bles		
<u>T</u>	<u>IME</u>	2 - 3	Periods						
<u>P</u>	ROC	EDUI	RES						
1.						-			our Earth Science characteristics.
	1101		- 1 we10s, w	<b>V</b>		OUS ROC			
						1 or LAB			
S'	ΓΑΤΙ	ON/S	AMPLE #	1					
		(	Color	□ Light C	olored	□ Dark (	Colored	□ In Betwe	een
		Con	position	□ Felsic	T	□ Mafic		□ In Betwe	een
Gr	ain S	ize	□ 10 mm		□ 1mm to	o 10mm		than 1mm	□ Non-crystalline
	'extur	1	□ Very C		□ Coarse	Grained	□ Fine	Grained	□ Glassy Texture
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Textu	ıre		ery Co	oarse		□ Coarse	Grained	□ Fine	Grained	□ Glassy Texture
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Grain S	Size	□ 10	mm (	or larg	ger	□ 1mm to	10mm	□ less t	than 1mm	□ Non-crystalline
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Grain S	ION/S Com Size	AMP Color positi	ion o mm o	□ Lig □ Fel or larg parse	sht Cosic ger <b>Key</b> Are	olored  1mm to Coarse  Videntifying there visit	□ Mafic 10mm Grained ng Feature	□ less t	□ In Betwe han 1mm Grained	een □ Non-crystalline
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-		ces sta	ate wh		sicular (gas	pockets)?			]
-				y thi		1 /			]
What is	the name	of thi	s igne	eous	rock?				
<b>STATIO</b>	N/SAMP	LE #7	<u>7</u>						
	Color		□ Lig	tht C	olored	□ Dark Co	olored	□ In Betwe	en
	Composit	ion	□ Fel	sic		□ Mafic		□ In Betwe	en
Grain Siz	e □ 10	mm (	or larg	ger	□ 1mm to	10mm	□ less t	han 1mm	□ Non-crystalline
Texture	$\Box$ V	ery Co	oarse		□ Coarse	Grained	□ Fine	Grained	□ Glassy Texture
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		Yes	No		•	ng Feature ole interlock		etale?	-
						pockets)?	ting crys	nais:	-
				7 03	(5as	Pockets):			1
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_		ces sta		-	s rock wou and explair	ıld be classi	ified as a	n igneous ro	ock. Include
_		ces sta		-		ıld be classi	ified as a	n igneous ro	ock. Include

		Color	□ Li	ght C	olored	□ Dark Co	olored	□ In Betwe	een
	Com	position	□ Fe	lsic		□ Mafic		□ In Betwe	een
Grain	Size	□ 10 m	m or lar	ger	□ 1mm to	10mm	□ less t	than 1mm	□ Non-crystalline
Textu	ure	□ Very	Coarse		□ Coarse	Grained	□ Fine	Grained	□ Glassy Texture
		<u> </u>			l				7
		Y	es No	<b>—</b>		ng Feature			1
		[				ole interloci	king crys	stals?	
		[		Ves	sicular (gas	pockets)?			
wheth	ner it is i	ntrusive	or extru	sive a	and explair	n why.			
What	is the r	nama of	this ion	21109	rock?				
	is the i	iaine oi	ins isi	cous	IUCK:				
.,		iaine oi	inis ign	cous	TOCK:				
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<u>LAB(</u> 1. De	ORATO escribe l	ORY QU	ESTIO	NS F	OR PART		cools eff	ects the size	of the crystals
<u>LAB(</u> 1. De	ORATO escribe l	ORY QU	ESTIO	NS F	OR PART		cools eff	ects the size	of the crystals
<u>LAB(</u> 1. De	ORATO escribe l	ORY QU	ESTIO	NS F	OR PART		cools eff	ects the size	of the crystals
<u>LAB(</u> 1. De	ORATO escribe l	ORY QU	ESTIO	NS F	OR PART		cools eff	ects the size	of the crystals
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LABC  1. Definition	ORATO escribe l rmed in	DRY QU how the an igned	ESTIO rate at w	NS F	OR PART	ek material o			of the crystals  n? Explain fully.
LABC  1. Definition	ORATO escribe l rmed in	DRY QU how the an igned	ESTIO rate at w	NS F	OR PART	ek material o			
LABC  1. Definition	ORATO escribe l rmed in	DRY QU how the an igned	ESTIO rate at w	NS F	OR PART	ek material o			
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2. Ho	ow can	pry QU how the an igned you tell i	ESTIO rate at woous rock	eous :	OR PART molten rock	ad an intrus	ive or ex	trusive origi	

5.	What are the two environments of formation for igneous rocks (where do igneous rocks form, use your ESRT)?
6.	List all the minerals that can be found in basalt.
7.	Where are pumice and obsidian formed?
8.	What does a vesicular texture mean?
9.	Igneous rocks with a felsic composition contain which elements?
10.	Igneous rocks with a mafic composition contain which elements?
11.	Which of the following rocks has the highest content of iron: granite, obsidian, basalt, or pumice?

## SEDIMENTARY ROCKS PART 2 or LAB 9B

Yes	No	<b>Key Identifying Feature</b>	Questions
			If you checked yes, are the clasts angular or rounded?
		Clastic (pieces of rock)	□ Angular □ Rounded
		Bioclastic	Can you see pieces of shells cemented together? Is it dark in color and made of compacted plant remains?
		Fossils	Can you see fossils in this sample?
		Crystalline	Can you see a crystalline structure in this sample?
		e name of this sedimentary	y this rock would be classified as a sedimentary rock.
wnat			
	<u> TION</u>	<u>/SAMPLE #10</u>	
	No.		Questions
<u>STA1</u>	1	/SAMPLE #10  Key Identifying Feature  Clastic (pieces of rock)	Questions  If you checked yes, are the clasts angular or rounded?  □ Angular □ Rounded
STAT Yes	No	Key Identifying Feature	If you checked yes, are the clasts angular or rounded?
STAT  Yes	No 🗆	Key Identifying Feature  Clastic (pieces of rock)	If you checked yes, are the clasts angular or rounded?  □ Angular □ Rounded  Can you see pieces of shells cemented together?  Is it dark in color and made of compacted plant
STAT  Yes	No	Key Identifying Feature  Clastic (pieces of rock)  Bioclastic	If you checked yes, are the clasts angular or rounded?  □ Angular □ Rounded  Can you see pieces of shells cemented together?  Is it dark in color and made of compacted plant remains?
Yes	No	Key Identifying Feature  Clastic (pieces of rock)  Bioclastic  Fossils  Crystalline	If you checked yes, are the clasts angular or rounded?  □ Angular □ Rounded  Can you see pieces of shells cemented together? Is it dark in color and made of compacted plant remains?  Can you see fossils in this sample?

Yes	No	Key Identifying Feature	Questions
			If you checked yes, are the clasts angular or rounded?
		Clastic (pieces of rock)	□ Angular □ Rounded
		Bioclastic	Can you see pieces of shells cemented together? Is it dark in color and made of compacted plant remains?
		Fossils	Can you see fossils in this sample?
		Crystalline	Can you see a crystalline structure in this sample?
In CO	OMPL:	ETE SENTENCES state wh	y this rock would be classified as a sedimentary rock.
		e name of this sedimentary  /SAMPLE #12	rock?
Yes	No	<b>Key Identifying Feature</b>	Questions
		Clastic (pieces of rock)	If you checked yes, are the clasts angular or rounded?  □ Angular □ Rounded
		Bioclastic	Can you see pieces of shells cemented together? Is it dark in color and made of compacted plant remains?
		Fossils	Can you see fossils in this sample?
		Crystalline	Can you see a crystalline structure in this sample?
In CO	MPL	ETE SENTENCES state wh	y this rock would be classified as a sedimentary rock.
What	is the	e name of this sedimentary	rock?

Yes	No	<b>Key Identifying Feature</b>	Questions
			If you checked yes, are the clasts angular or rounded?
		Clastic (pieces of rock)	□ Angular □ Rounded
		Bioclastic	Can you see pieces of shells cemented together? Is it dark in color and made of compacted plant remains?
		Fossils	Can you see fossils in this sample?
		Crystalline	Can you see a crystalline structure in this sample?
In CO	MPL	ETE SENTENCES state why	y this rock would be classified as a sedimentary rock.
What	is the	e name of this sedimentary	rock?
<u>STAT</u>	TON.	/SAMPLE #14	
Yes	No	Key Identifying Feature	Questions
		Clastic (pieces of rock)	If you checked yes, are the clasts angular or rounded?  □ Angular □ Rounded
		Bioclastic	Can you see pieces of shells cemented together? Is it dark in color and made of compacted plant remains?
		Fossils	Can you see fossils in this sample?
		Crystalline	Can you see a crystalline structure in this sample?
In CO	MPL	ETE SENTENCES state why	y this rock would be classified as a sedimentary rock.

### **LABORATORY QUESTIONS FOR PART 2 or LAB 9B**

1. Draw a picture (an actual oval shape) of a pebble of **maximum** size.

2.	What are the maximum and minimum dimensions (size range) for the following particles:
	a. sand:
	b. pebble:
	c. cobble:
3.	Explain how a clastic sedimentary rock such as sandstone formed differently than a chemically formed sedimentary rock such as gypsum.
4.	How would the particles that make up a conglomerate differ from the particles in a sandstone or shale?
5.	Sandstone is made of what mineral(s)?
6.	In what way is the overall appearance of a breccia different from that of conglomerate?
7.	What chemical test could be used to identify limestone? Explain.

# METAMORPHIC ROCKS PART 3 or LAB 9C

	No	Key Identifying Feature	Questions
			Do you notice any mineral alignment and/or banding?
		Foliated	If you checked yes and it is banded: If yes then it's gneiss
		Microscopic Mica Crystals	Does the rock appear slightly shiny with slight mineral alignment? If yes then it's phylitte
		Platy Mica Crystals	Do you notice larger shiny mica crystals with some mineral alignment? If yes then it's schist
		Nonfoliated	If you checked no for all of the above, then your rock is nonfoliated. Please use the ESRT comments and rock map symbols to help identify
		t was the parent rock? The t and pressure? Use ESRT!	ype of rock it was before it was changed due to
In CC	MDI	ETE CENTENCES atata sub-	within roak would be alongified as a motomorphic real-
ın CC	WIPL.	E I E SEN I ENCES STATE WAY	y this rock would be classified as a metamorphic rock.
What	is the	e name of this metamorphi	c rock?
STA	ΓΙΟΝ	ICANIDI IC 417	
	11011/	<u>/SAMPLE #16</u>	
			Questions
Yes	No	Key Identifying Feature	Questions  Do you notice any mineral alignment and/or banding?
			Do you notice any mineral alignment and/or banding?
Yes	No	Key Identifying Feature	Do you notice any mineral alignment and/or banding?  If you checked yes and it is banded: If yes then it's gneiss
Yes	No	Key Identifying Feature	Do you notice any mineral alignment and/or banding?
Yes	No	Key Identifying Feature  Foliated	Do you notice any mineral alignment and/or banding?  If you checked yes and it is banded: If yes then it's gneiss  Does the rock appear slightly shiny with slight mineral
Yes	No □	Key Identifying Feature  Foliated  Microscopic Mica Crystals	Do you notice any mineral alignment and/or banding?  If you checked yes and it is banded: If yes then it's gneiss  Does the rock appear slightly shiny with slight mineral alignment? If yes then it's phylitte  Do you notice larger shiny mica crystals with some mineral alignment? If yes then it's schist  If you checked no for all of the above, then your rock is nonfoliated. Please use the ESRT comments and rock
Yes	No □ □ □ Wha	Key Identifying Feature Foliated Microscopic Mica Crystals Platy Mica Crystals Nonfoliated	Do you notice any mineral alignment and/or banding?  If you checked yes and it is banded: If yes then it's gneiss  Does the rock appear slightly shiny with slight mineral alignment? If yes then it's phylitte  Do you notice larger shiny mica crystals with some mineral alignment? If yes then it's schist  If you checked no for all of the above, then your rock is
Yes	No  Wha heat	Key Identifying Feature  Foliated  Microscopic Mica Crystals  Platy Mica Crystals  Nonfoliated  t was the parent rock? The tand pressure? Use ESRT!	Do you notice any mineral alignment and/or banding?  If you checked yes and it is banded: If yes then it's gneiss  Does the rock appear slightly shiny with slight mineral alignment? If yes then it's phylitte  Do you notice larger shiny mica crystals with some mineral alignment? If yes then it's schist  If you checked no for all of the above, then your rock is nonfoliated. Please use the ESRT comments and rock map symbols to help identify
Yes	No  Wha heat	Key Identifying Feature  Foliated  Microscopic Mica Crystals  Platy Mica Crystals  Nonfoliated  t was the parent rock? The tand pressure? Use ESRT!	Do you notice any mineral alignment and/or banding?  If you checked yes and it is banded: If yes then it's gneiss  Does the rock appear slightly shiny with slight mineral alignment? If yes then it's phylitte  Do you notice larger shiny mica crystals with some mineral alignment? If yes then it's schist  If you checked no for all of the above, then your rock is nonfoliated. Please use the ESRT comments and rock map symbols to help identify  ype of rock it was before it was changed due to

Foliated   If you checked yes and it is banded: If yes then it's gneis   Does the rock appear slightly shiny with slight mineral alignment? If yes then it's phylitte   Do you notice larger shiny mica crystals with some mineral alignment? If yes then it's schist	Yes	No	Key Identifying Feature	Questions
If you checked yes and it is banded: If yes then it's gnei alignment? If yes then it's phylitte   Does the rock appear slightly shiny with slight mineral alignment? If yes then it's phylitte   Do you notice larger shiny mica crystals with some mineral alignment? If yes then it's schist				Do you notice any mineral alignment and/or banding?
□         Microscopic Mica Crystals         Does the rock appear slightly shiny with slight mineral alignment? If yes then it's phylitize           □         Platy Mica Crystals         Do you notice larger shiny mica crystals with some mineral alignment? If yes then it's schist           □         Nonfoliated         If you checked no for all of the above, then your rock in nonfoliated. Please use the ESRT comments and rock map symbols to help identify           What was the parent rock? The type of rock it was before it was changed due to heat and pressure? Use ESRT!         In COMPLETE SENTENCES state why this rock would be classified as a metamorphic rock.           What is the name of this metamorphic rock?         STATION/SAMPLE #18           Yes         No         Key Identifying Feature         Questions           □         Do you notice any mineral alignment and/or banding?         If you checked yes and it is banded: If yes then it's gneint processes the standard of the processes of the rock appear slightly shiny with slight mineral alignment? If yes then it's phylitize           □         Platy Mica Crystals         Do you notice larger shiny mica crystals with some mineral alignment? If yes then it's schist           □         Nonfoliated         Do you notice larger shiny mica crystals with some mineral alignment? If yes then it's schist           □         Platy Mica Crystals         Do you notice larger shiny mica crystals with some mineral alignment? If yes then it's schist           □         Nonfoliated         Please use the ESR			Foliated	If you checked ves and it is handed: If yes then it's gneiss
mineral alignment? If yes then it's schist			Microscopic Mica Crystals	Does the rock appear slightly shiny with slight mineral
Nonfoliated   nonfoliated. Please use the ESRT comments and rock map symbols to help identify    What was the parent rock? The type of rock it was before it was changed due to heat and pressure? Use ESRT!    In COMPLETE SENTENCES state why this rock would be classified as a metamorphic rock.    What is the name of this metamorphic rock?			Platy Mica Crystals	1 .
heat and pressure? Use ESRT!  In COMPLETE SENTENCES state why this rock would be classified as a metamorphic rock.  What is the name of this metamorphic rock?  STATION/SAMPLE #18  Yes No Key Identifying Feature Questions  Do you notice any mineral alignment and/or banding?  If you checked yes and it is banded: If yes then it's gneit Does the rock appear slightly shiny with slight mineral alignment? If yes then it's phylitte  Platy Mica Crystals Do you notice larger shiny mica crystals with some mineral alignment? If yes then it's schist  If you checked no for all of the above, then your rock nonfoliated. Please use the ESRT comments and rock map symbols to help identify  What was the parent rock? The type of rock it was before it was changed due to heat and pressure? Use ESRT!			Nonfoliated	If you checked no for all of the above, then your rock is nonfoliated. Please use the ESRT comments and rock map symbols to help identify
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### **LABORATORY QUESTIONS FOR PART 3 or 9C**

1.	What happens to the grain size in a rock as it goes from low to high grade metamorphism?
2	
2.	How could hydrochloric acid be used to tell quartzite from marble?
3.	Why are fossils not usually found in metamorphic rocks?
4.	Explain how foliation occurs in metamorphic rocks.
5.	On what basis can metamorphic rocks be identified?
(	Manage to the second of the se
6.	Many types of gneiss have formed from granite. How is gneiss different in appearance from granite?
7.	What sedimentary rock does slate most closely resemble?