



**KAPITAŁ LUDZKI**  
NARODOWA STRATEGIA SPÓJNOŚCI



**UNIA EUROPEJSKA**  
EUROPEJSKI  
FUNDUSZ SPOŁECZNY



# ***ZESTAW ĆWICZEŃ DO BLOKU MATEMATYCZNO- PRZYRODNICZEGO***

## ***GIMNAZJUM***

***zestawy dla uczniów niewidomych***  
*(do wypuklenia na papierze puchnącym)*  
***zestawy dla uczniów słabo widzących***

### **Autorzy:**

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**mgr Beata Cieślińska - Bodzioch**

**mgr Magdalena Maciejak**

Projekt „Blżej świata – od konkretnu do abstrakcji” jest współfinansowany ze środków Unii Europejskiej w ramach Europejskiego Funduszu Społecznego  
Poddziałanie 3.3.4. POKL

## **Rysunki do bloku matematyczno-przyrodniczego BIOLOGIA**

**Autor: Wiesława Karasińska**

1. Kształty komórek bakterii
2. Budowa komórki roślinnej i zwierzęcej
3. Konwalia majowa – systematyka
4. Mak polny – systematyka
5. Szarotka – występowanie
6. Kształty i unerwienie blaszki liściowej – cz 1
7. Kształty i unerwienie blaszki liściowej – cz 2
8. Rozpoznawanie gatunków na podstawie blaszki liściowej
9. Budowa rośliny okrytonasiennej
10. Budowa owocu
11. Budowa ryby
12. Ryby słodkowodne w Polsce
13. Ryby morskie
14. Rekin – ryba chrzęstnoszkieletowa
15. Wieloryb
16. Orki
17. Narwal
18. Budowa jaja
19. Rozpoznawanie zwierząt
20. Parki Narodowe w Polsce

## Rysunki do bloku matematyczno-przyrodniczego CHEMIA

*Autor: Anna Kołosowska*

1. Atomy i cząsteczki
2. Modele atomów różnych pierwiastków
3. Model atomu tlenu
4. Cząsteczki dwuatomowe gazów
5. Izotopy wodoru
6. Jądro atomowe
7. Cząsteczka wody
8. Cząsteczka tlenku węgla
9. Cząsteczka tlenku siarki
10. Asocjacja cząsteczki wody
11. Gęstość gazów
12. Skład procentowy powietrza
13. Metryka pierwiastka
14. Lantanowce, aktynowce
15. Układ okresowy pierwiastków
16. Pierwiastki grup głównych od I do IV okresu
17. Dawne nazwy pierwiastków
18. Substancje szkodliwe
19. Substancje żrące
20. Termometr

## Rysunki do bloku matematyczno-przyrodniczego FIZYKA

Autor: *Beata Cieślińska-Bodzioch*

1. Skale temperatur
2. Termometr lekarski
3. Anomalna rozszerzalność cieplna wody
4. Znaczenie anomalnej rozszerzalności wody w przyrodzie
5. Zjawisko rozszerzalności zamrożonej wody – woda w temperaturze pokojowej
6. Zjawisko rozszerzalności zamrożonej wody – woda w trakcie zamarzania
7. Linie energetyczne podczas lata
8. Linie energetyczne zimą
9. Bimetal
10. Ciało stałe
11. Ciecz
12. Gaz
13. Menisk wklęsły i wypukły
14. Topnienie wykres

## **Rysunki do bloku matematyczno-przyrodniczego MATEMATYKA**

**Autorki: *Ewa Dziewiątkowska, Lucyna Kołomyjec***

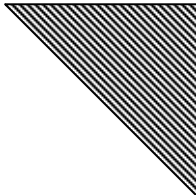
1. Osie
2. Oś liczbowa
3. Oś przedział otwarty
4. Oś przedział domknięty
5. Układ współrzędnych
6. Układ współrzędnych punkty
7. Układ współrzędnych punkty
8. Układ współrzędnych punkty

## **Rysunki do bloku matematyczno-przyrodniczego GEOGRAFIA**

**Autor: *Magdalena Maciejak***

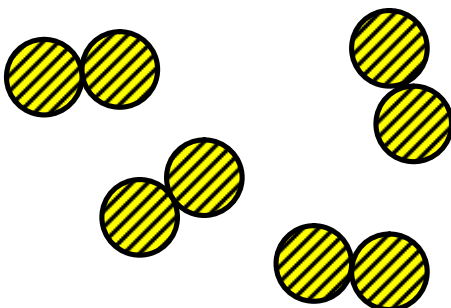
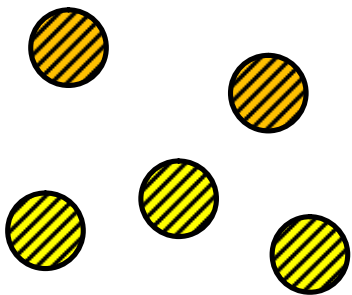
1. Czytanie współrzędnych geograficznych
2. Czytanie współrzędnych geograficznych
3. Kierunki świata
4. Obliczanie czasu słonecznego
5. Obliczanie czasu słonecznego
6. Obliczanie czasu słonecznego
7. Meander
8. Starorzecza
9. Współrzędne geograficzne Polski
10. Podział administracyjny Polski

# Biologia



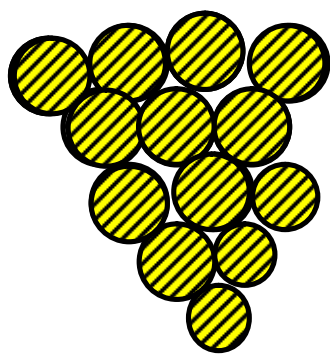
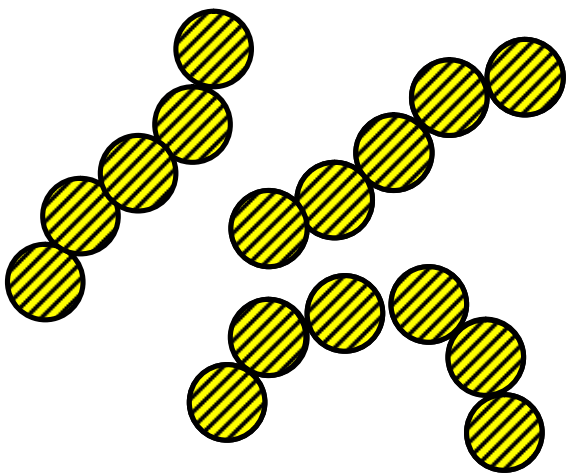
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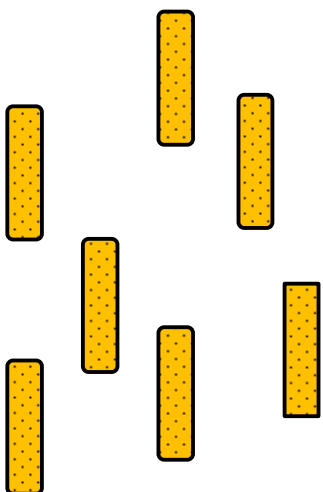
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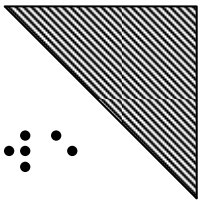


9 8 7 6

9 8 7



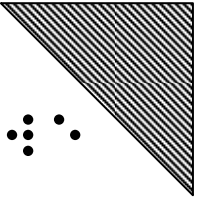




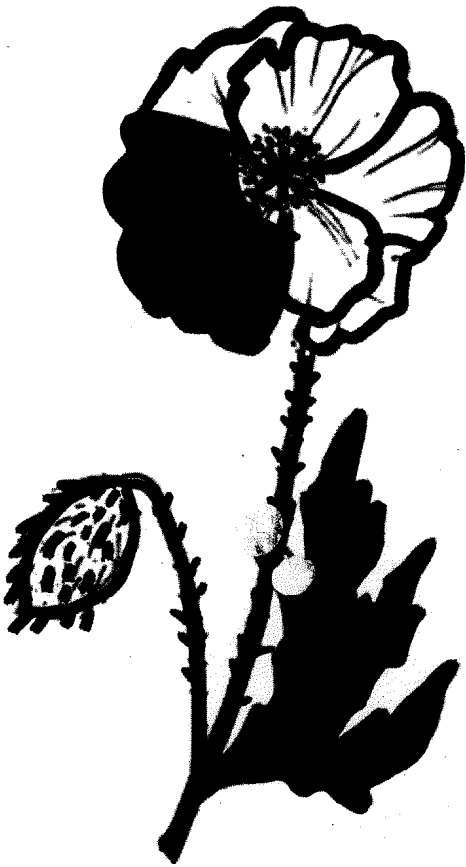
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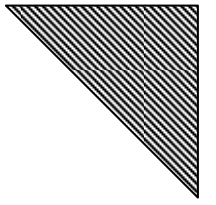
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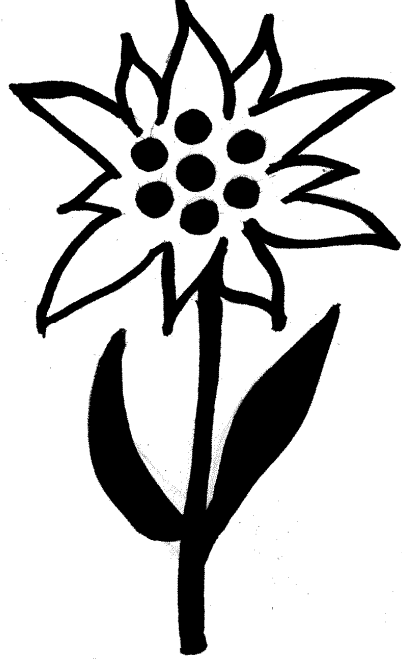
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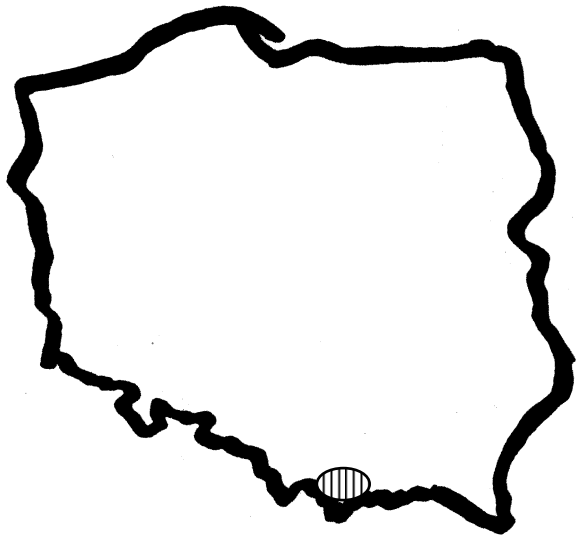
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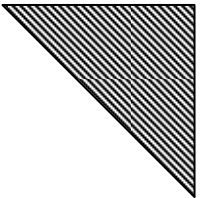
Braille text consisting of two groups of characters.



Braille text consisting of two groups of characters, with the second character in the first group enclosed in a box.

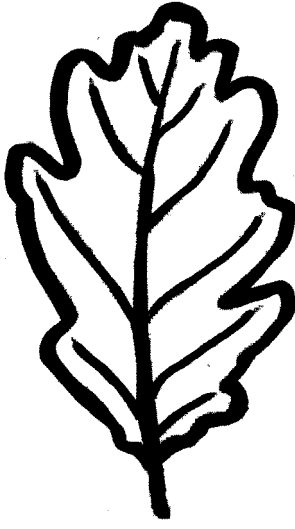
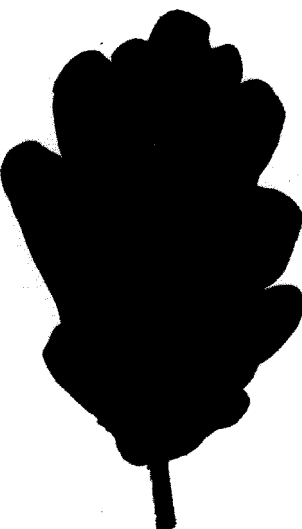


Braille text consisting of two groups of characters. The second character in the first group and the last character in the second group are enclosed in boxes.

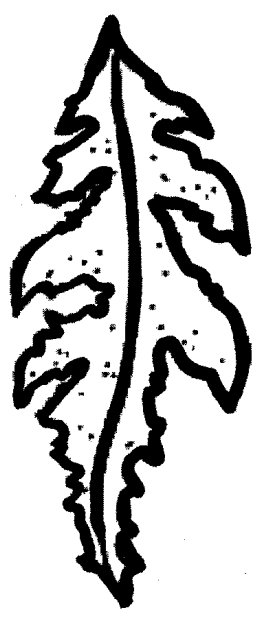


Q u e r c u s i s a g e n s i s

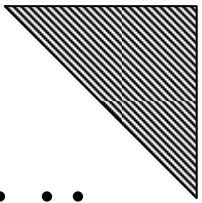
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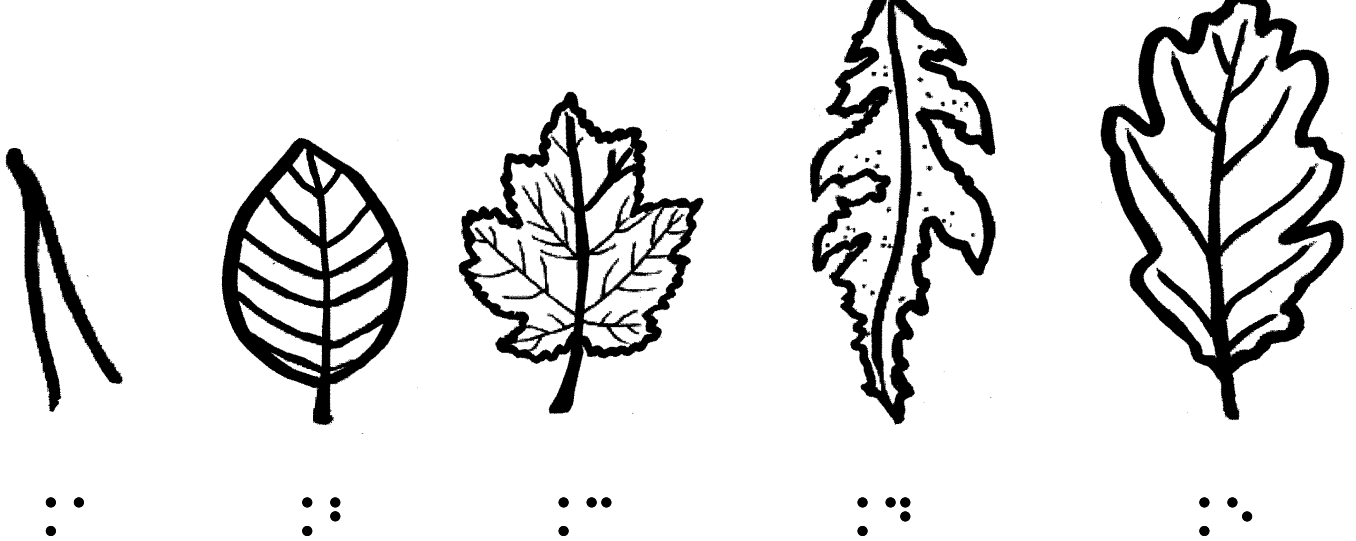
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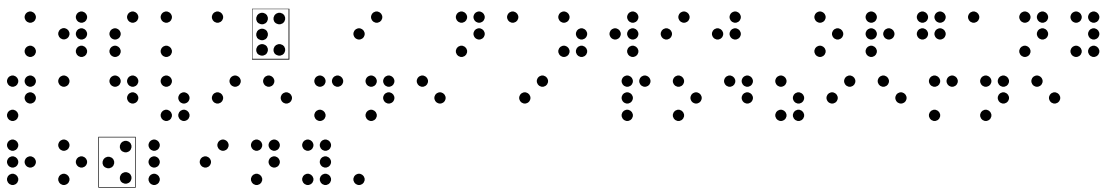
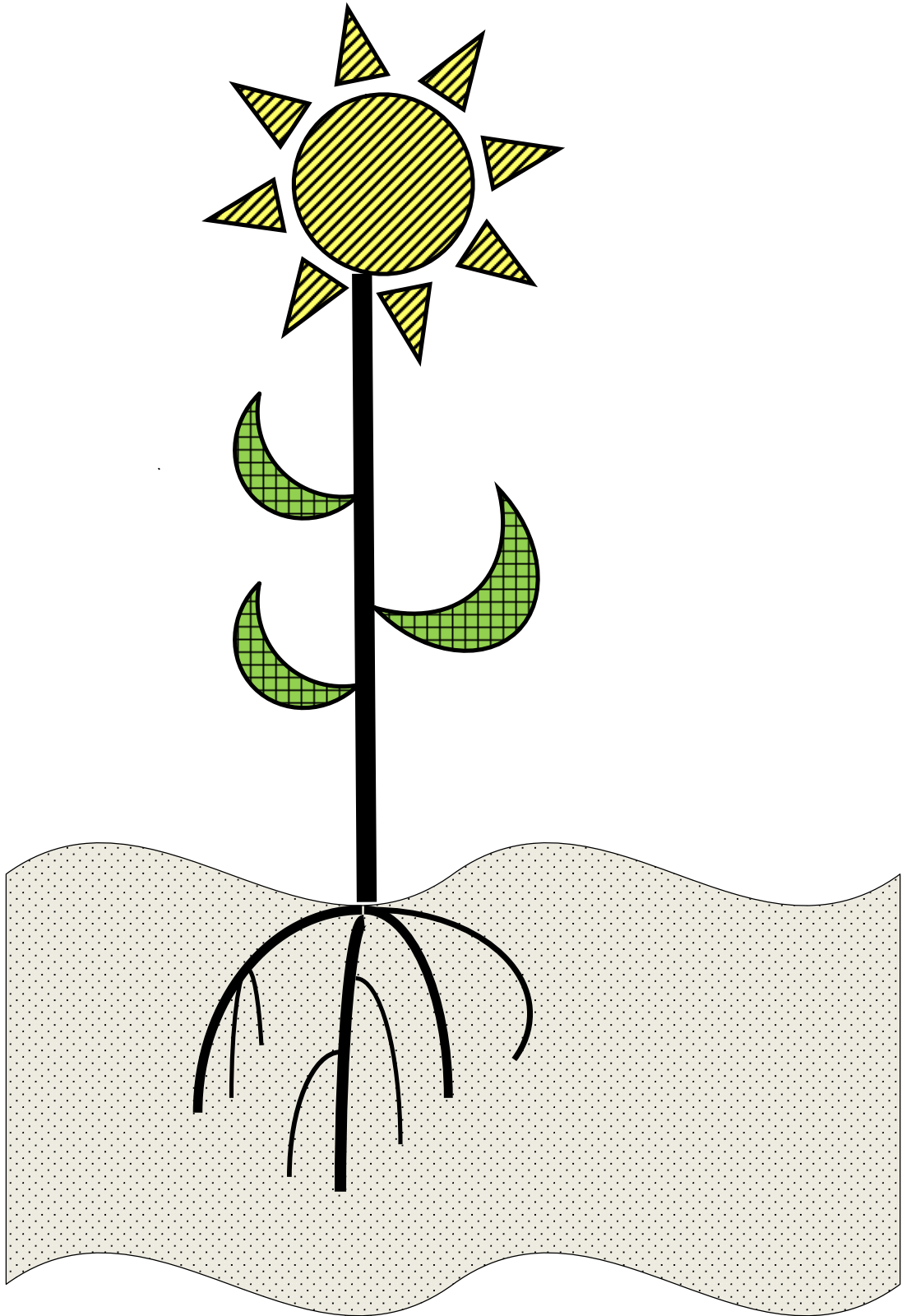
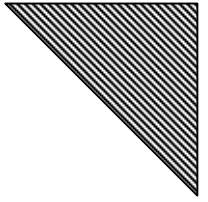
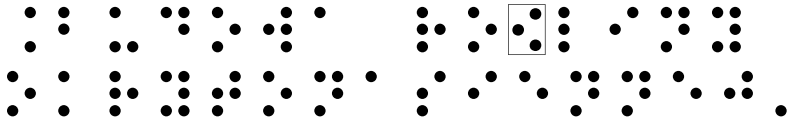






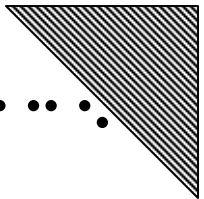
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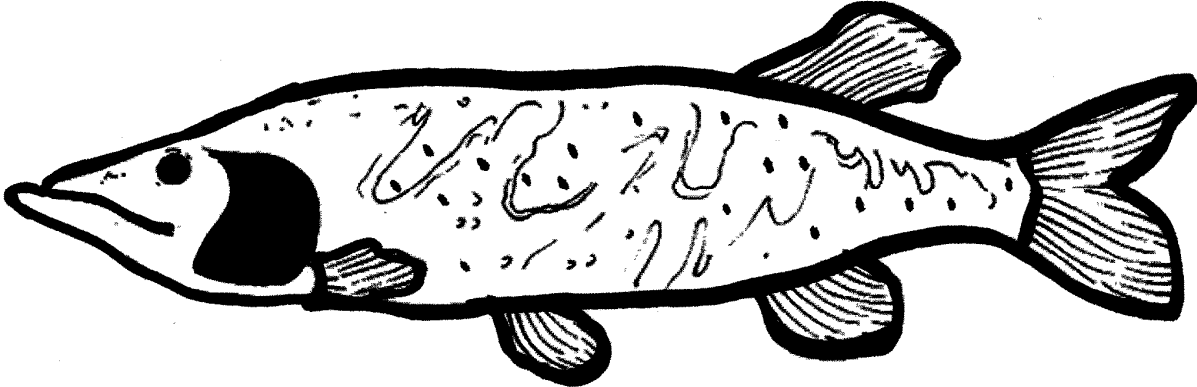
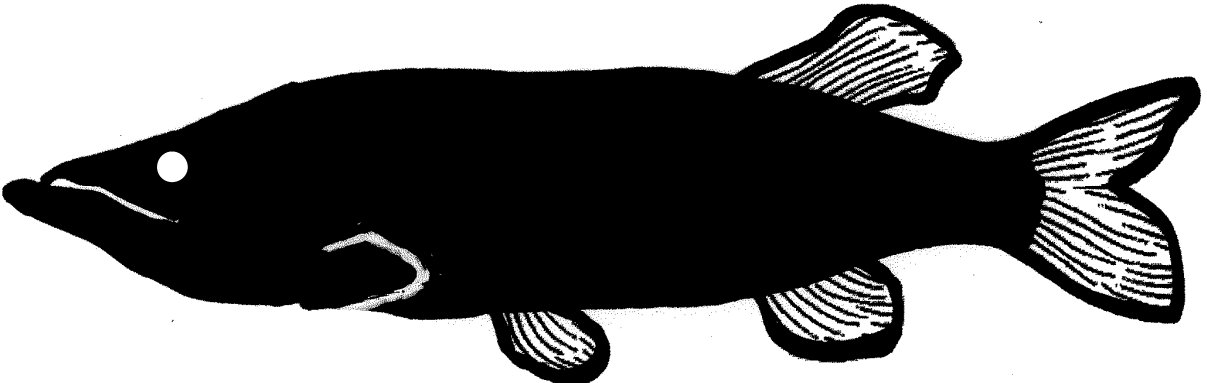




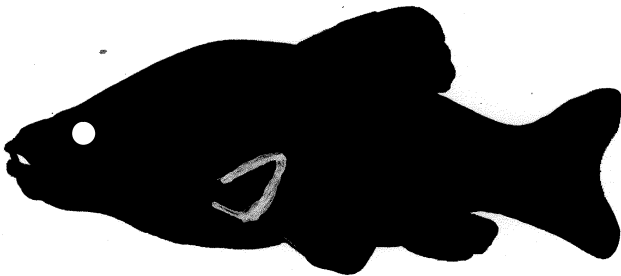


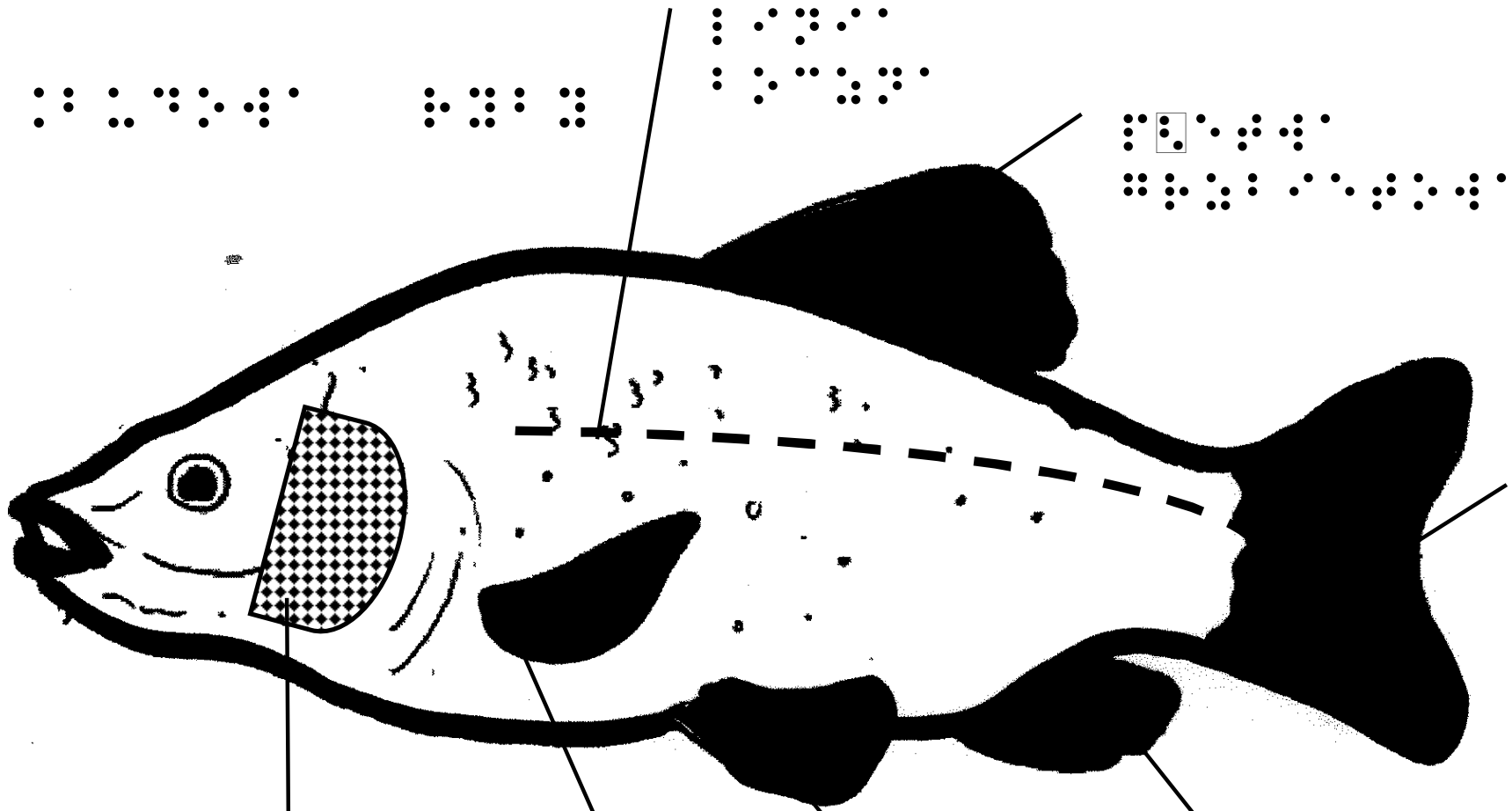
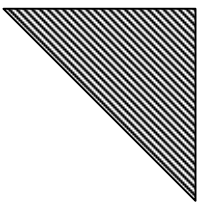
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Braille label for the head area.

Braille label for the eye area.

Braille label for the dorsal fin area.

Braille label for the tail area (top).

Braille label for the tail area (right).

Braille label for the gill area.

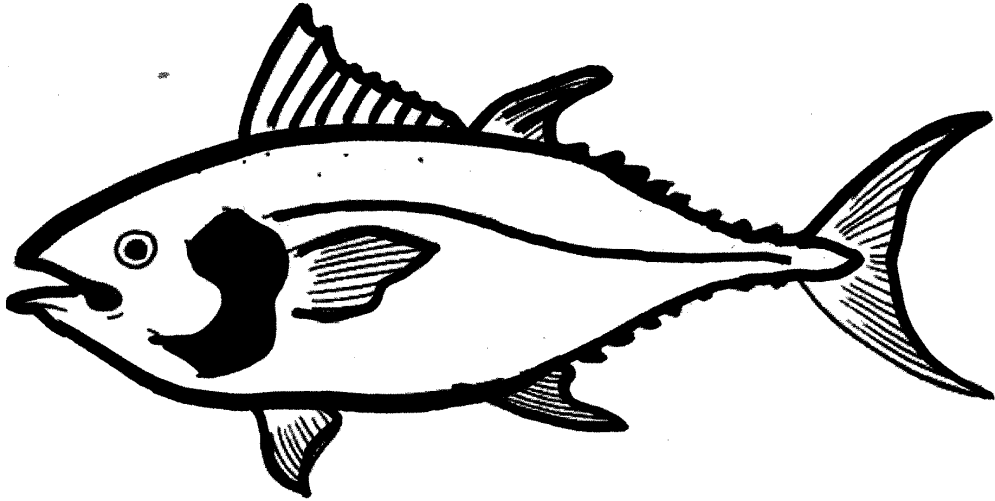
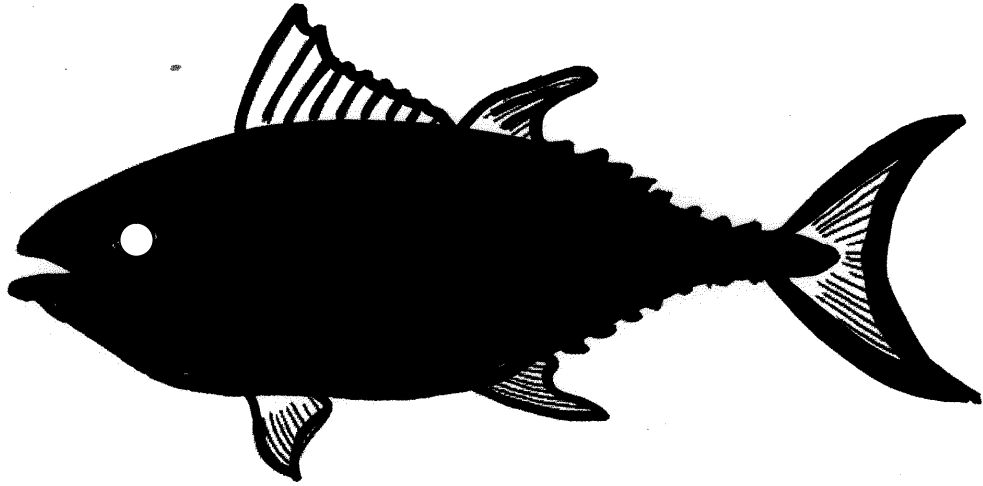
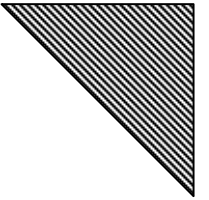
Braille label for the pelvic fin area.

Braille label for the anal fin area.

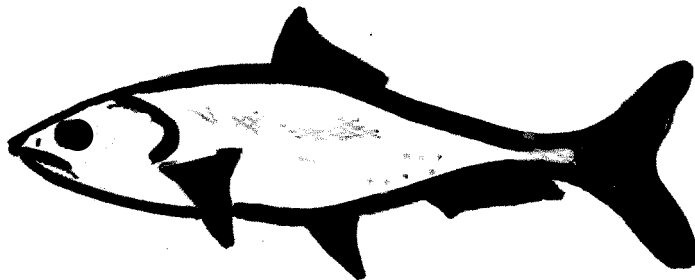
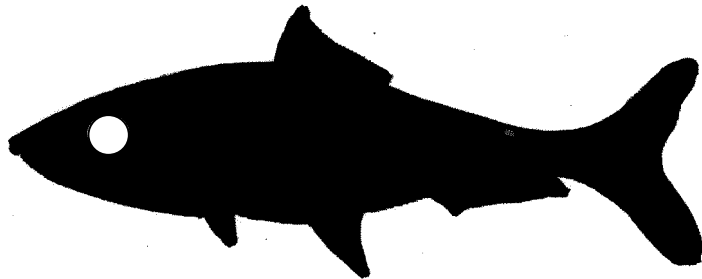
Braille label for the head area (bottom).

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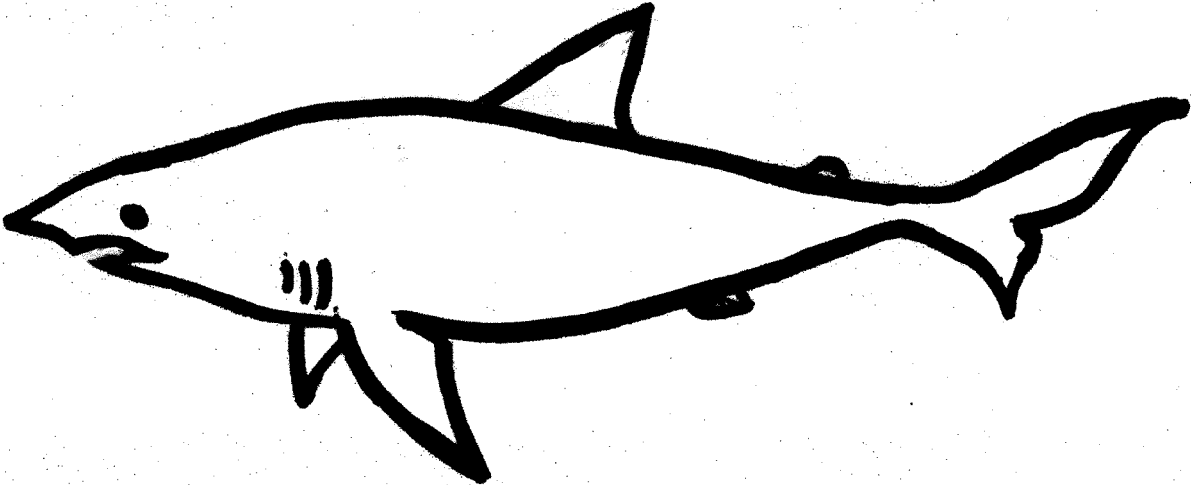
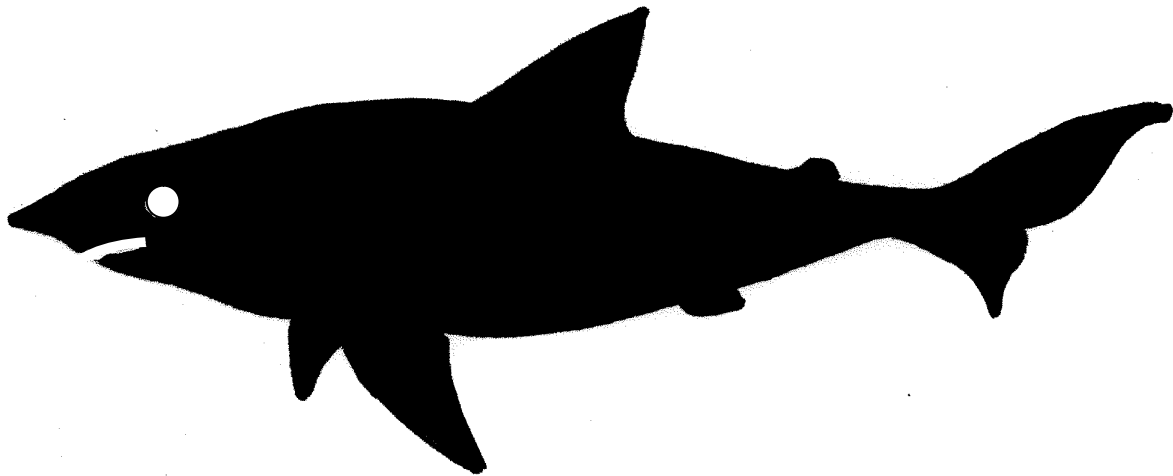
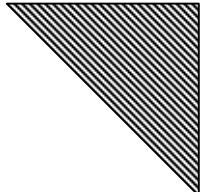
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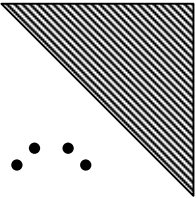


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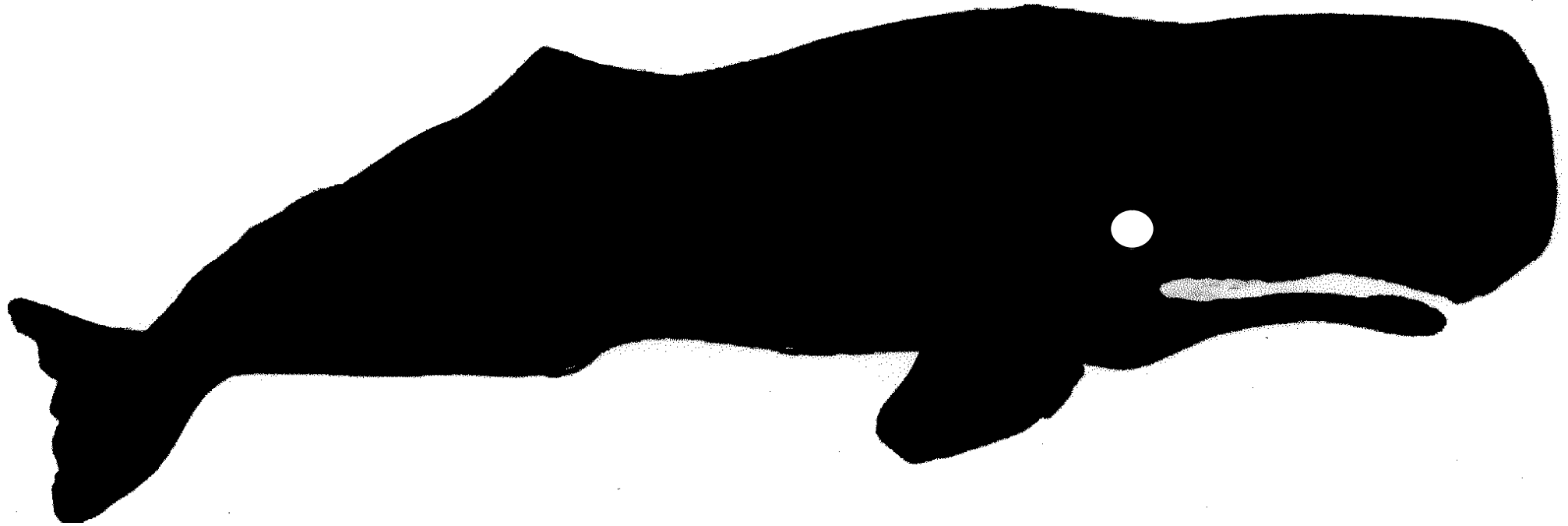


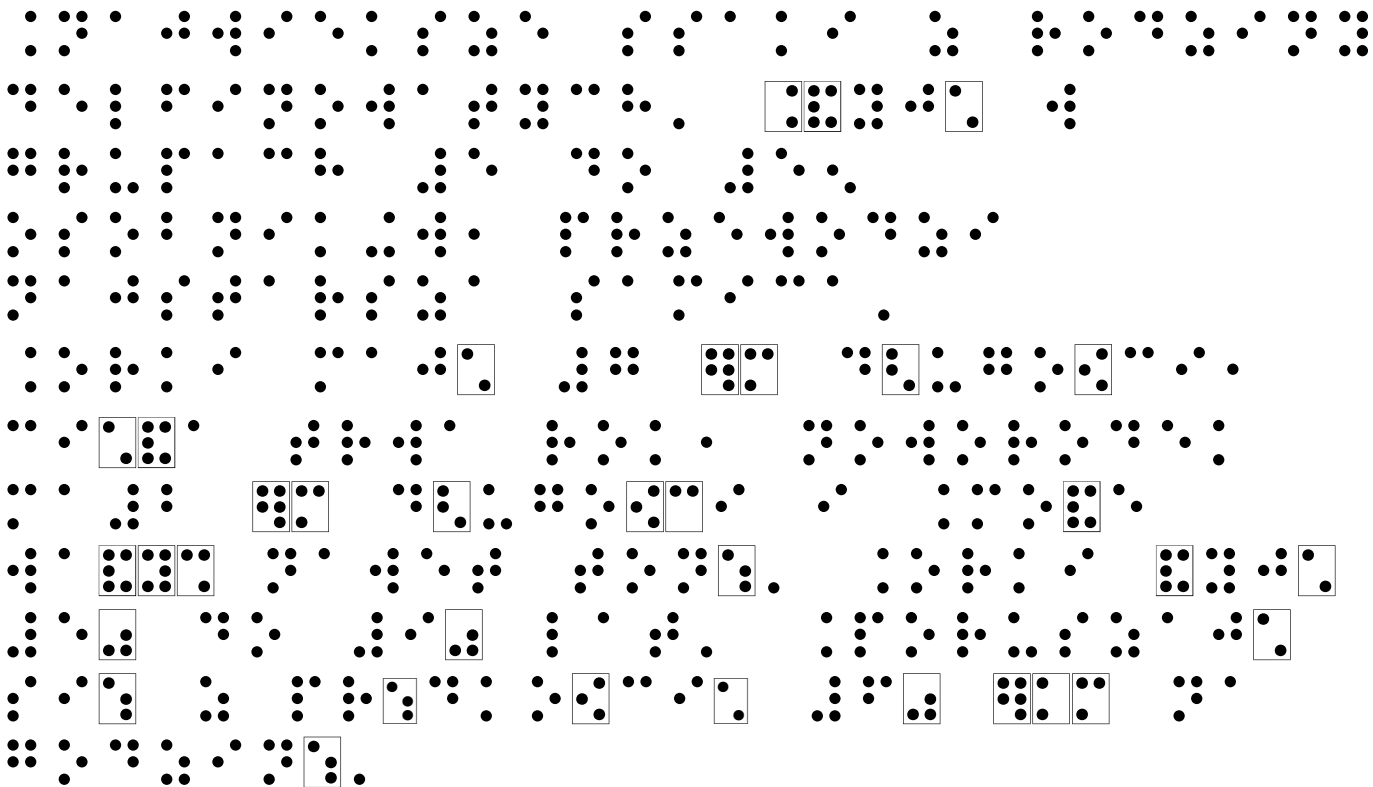
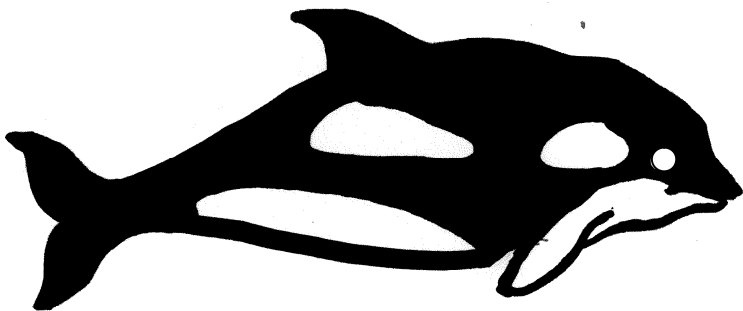
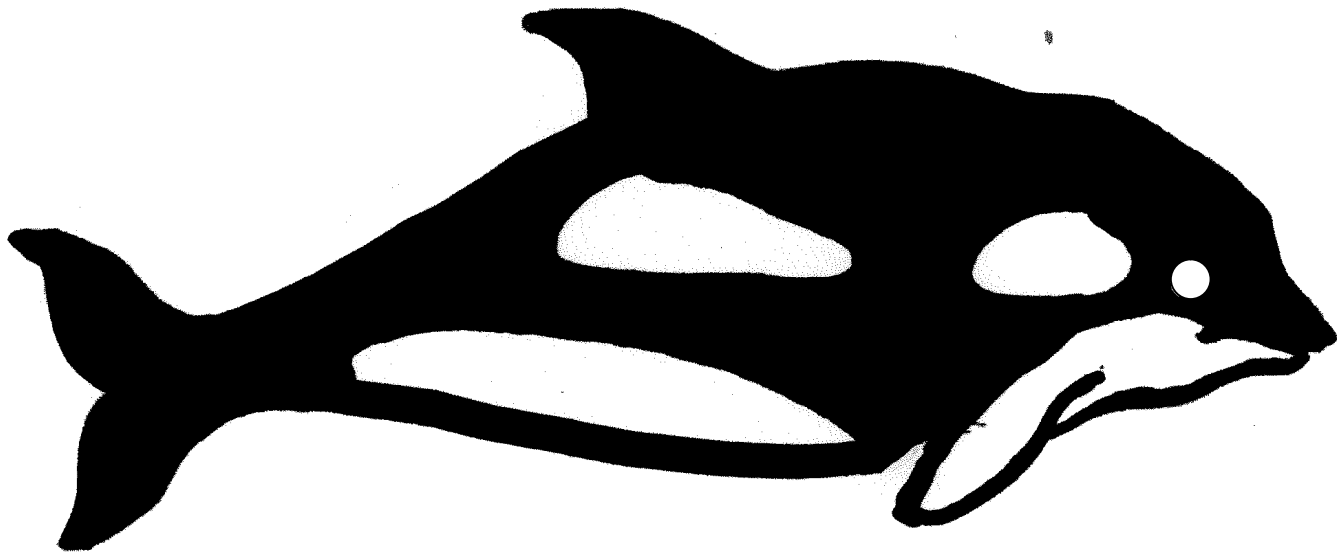
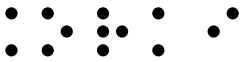
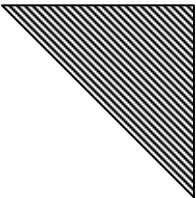
Handwritten Braille text consisting of multiple lines of Braille characters.

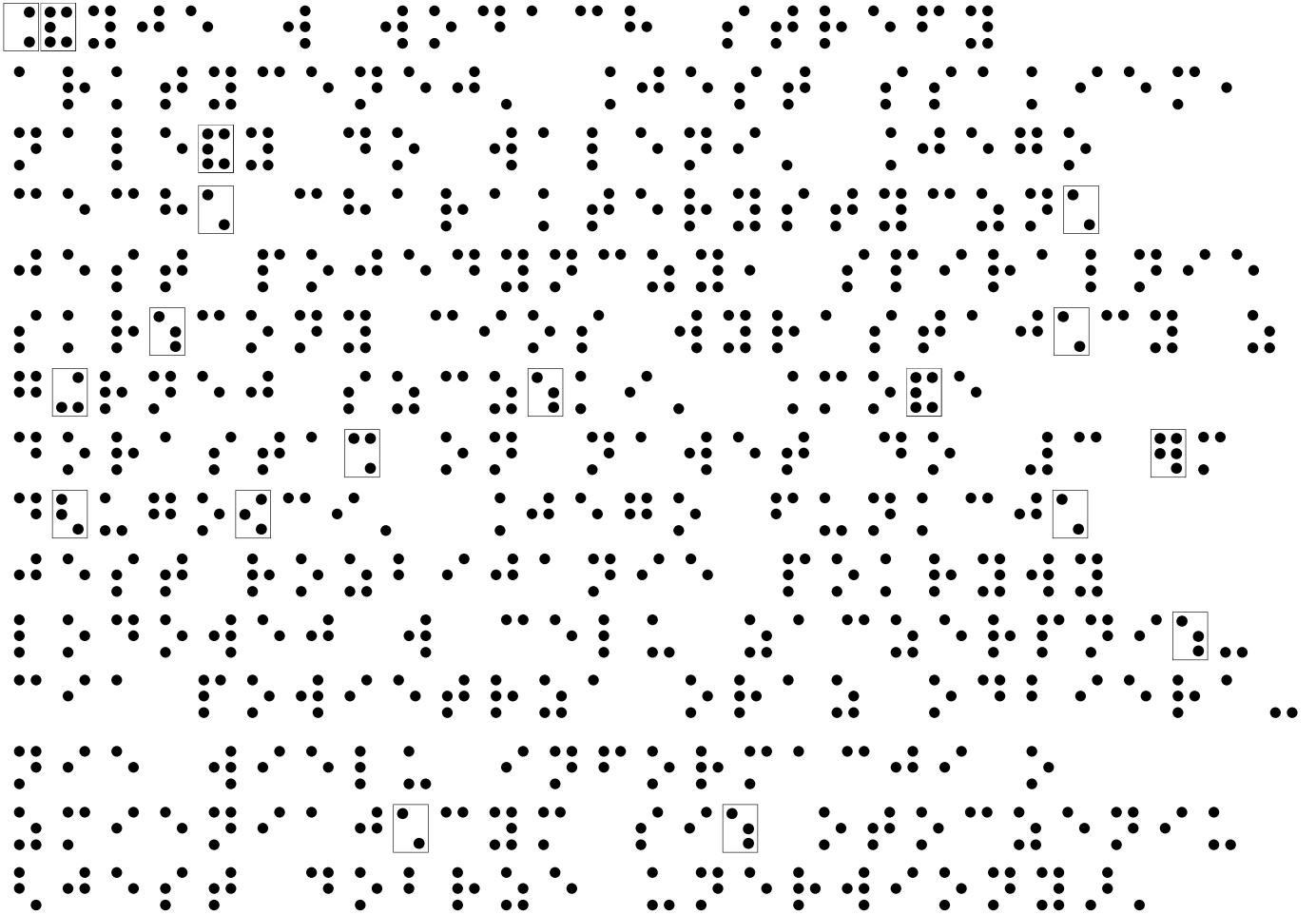
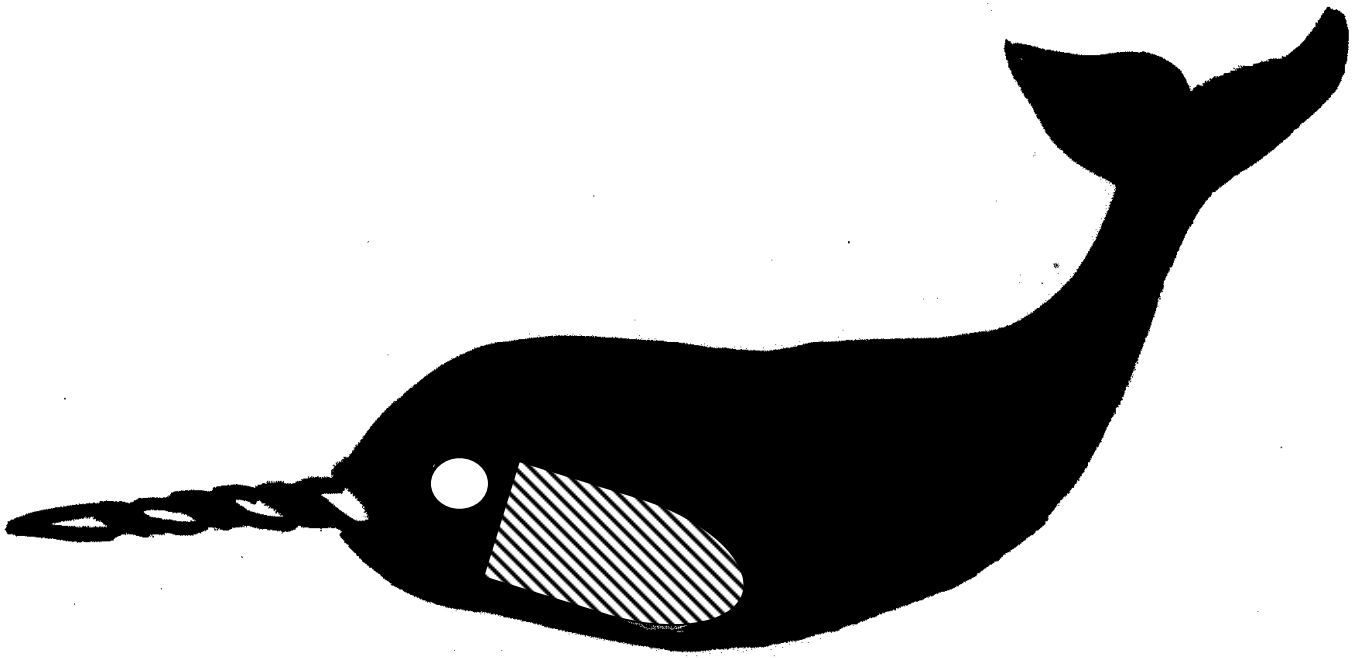
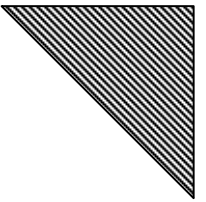




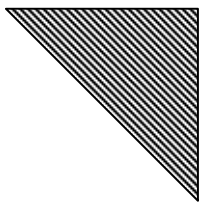
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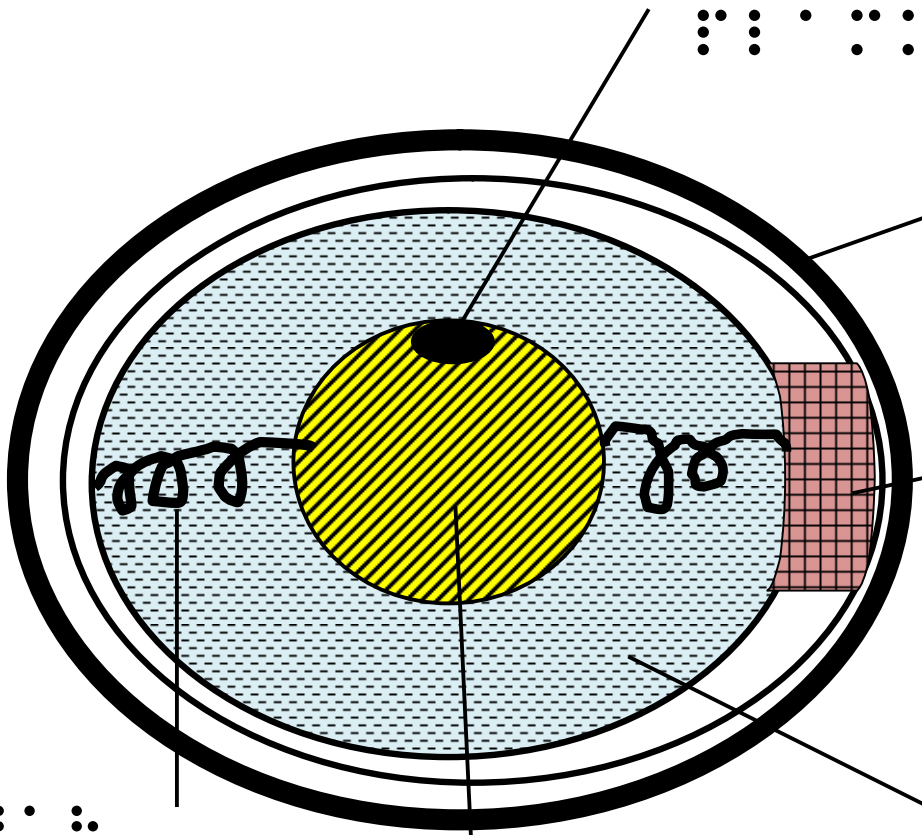






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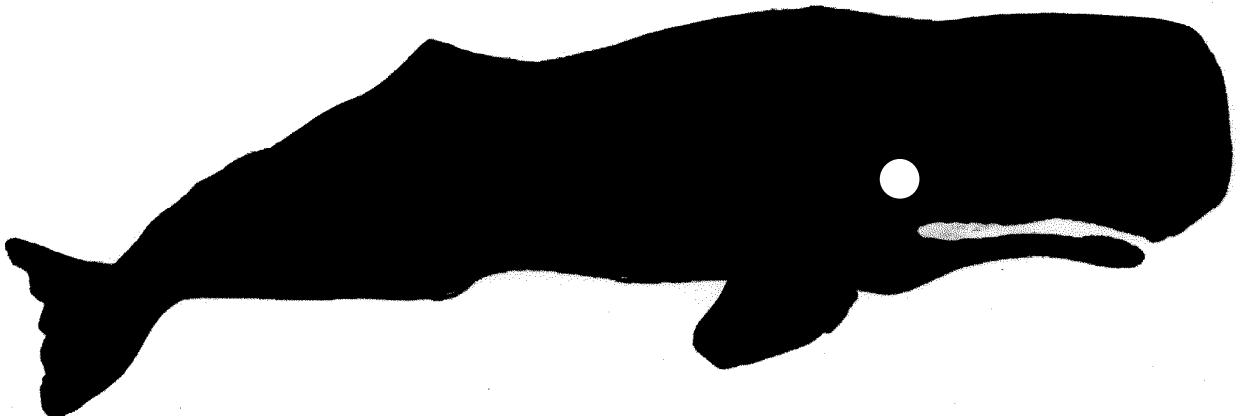
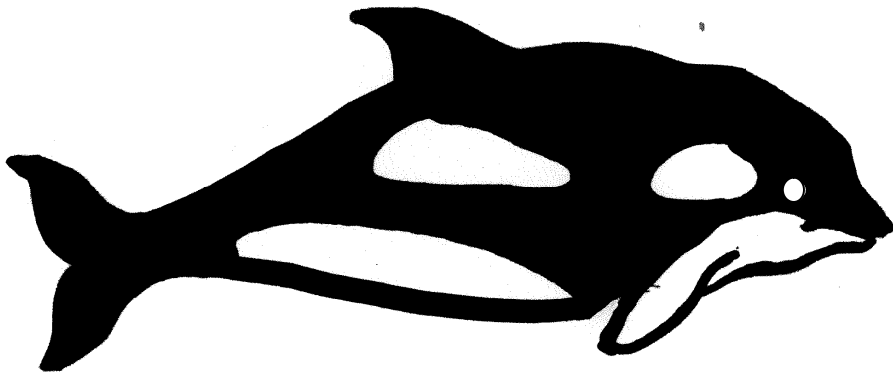
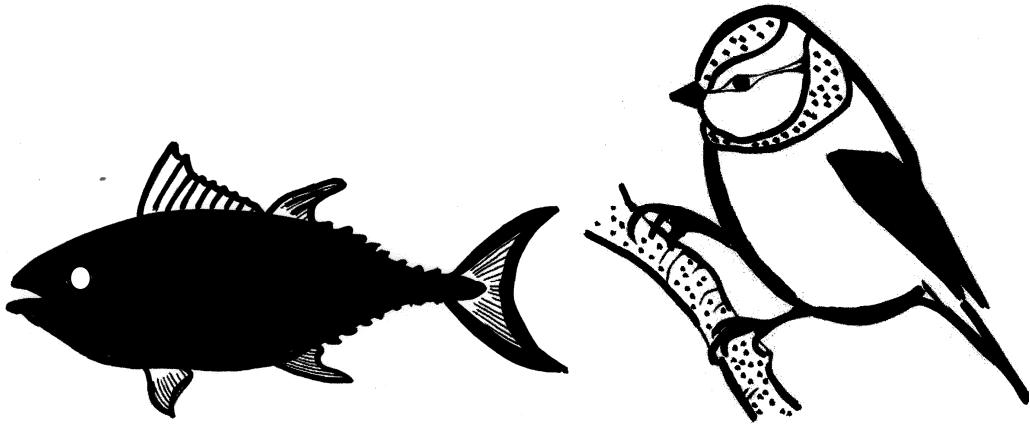
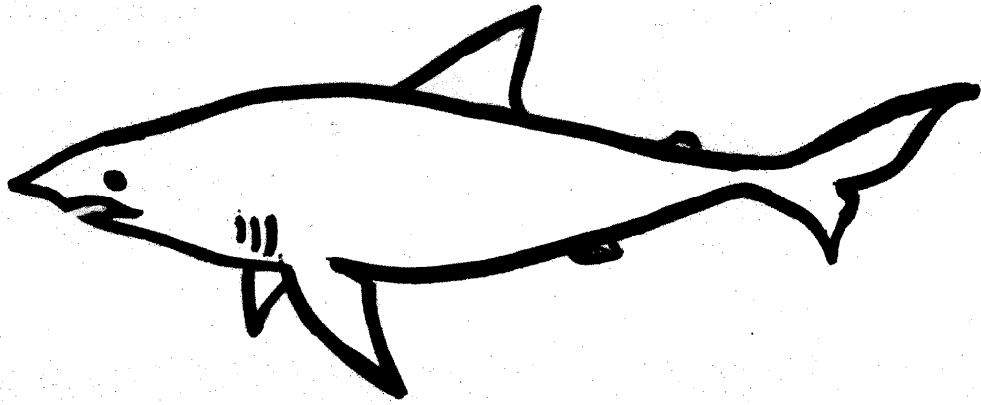
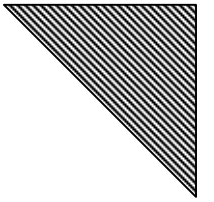
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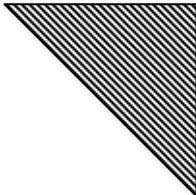
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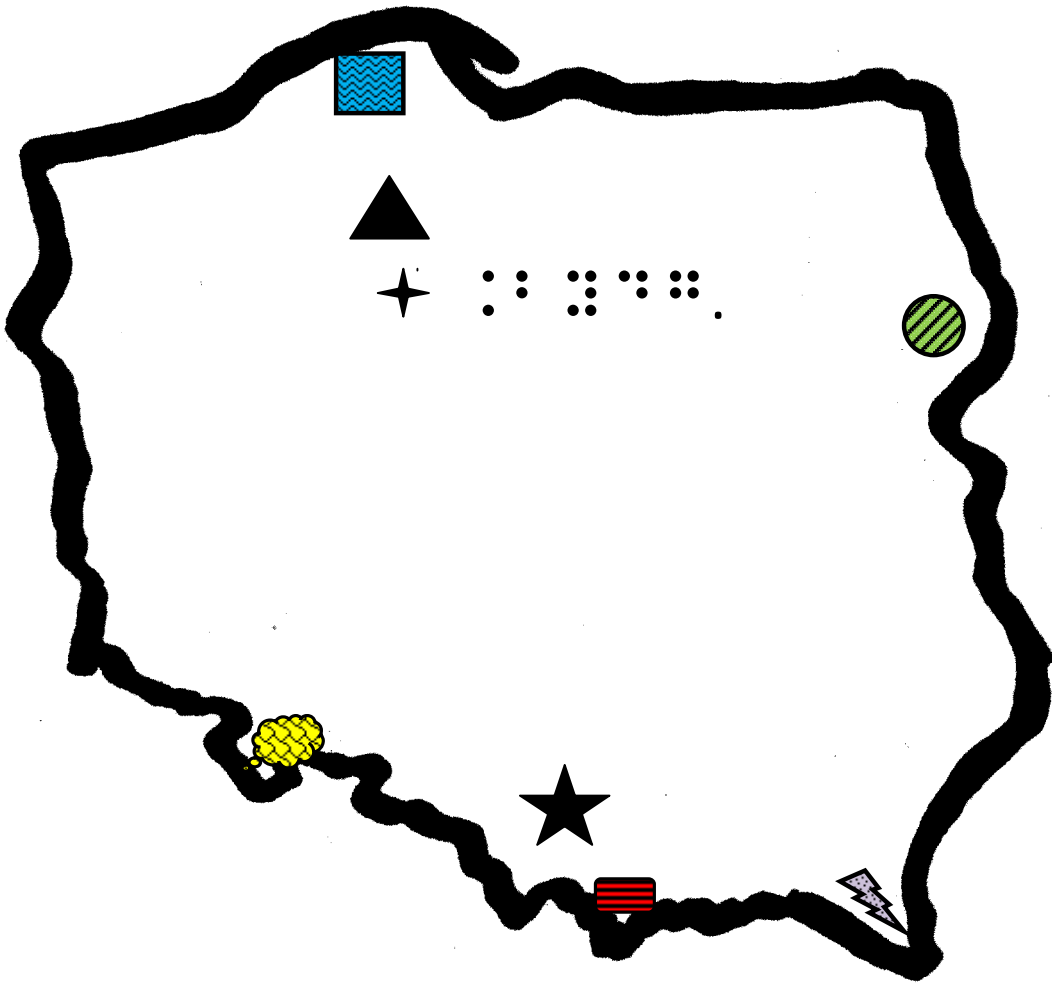


Braille text consisting of several lines of dots, with some characters enclosed in rectangular boxes.





Braille text at the top of the page, consisting of several lines of characters.



Braille text corresponding to the black triangle symbol.



Braille text corresponding to the blue wavy square symbol.



Braille text corresponding to the green striped circle symbol.



Braille text corresponding to the red striped rectangle symbol.



Braille text corresponding to the lightning bolt symbol.

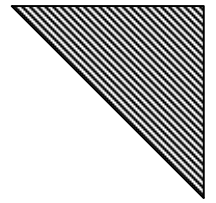


Braille text corresponding to the black star symbol.

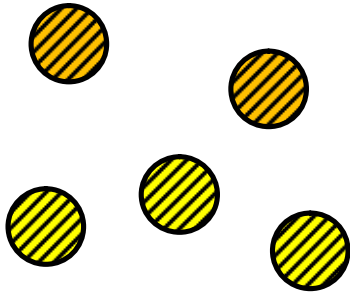


Braille text corresponding to the yellow textured circle symbol.

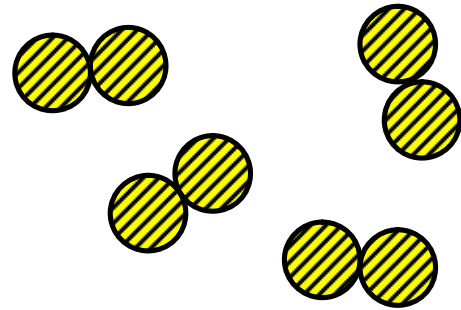
# Kształty komórek bakteryjnych



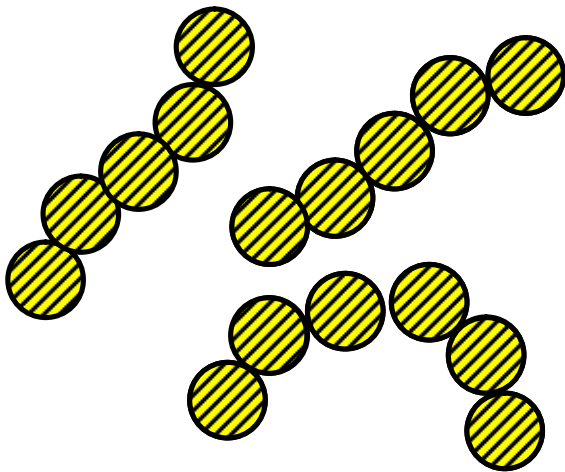
Kuleczki



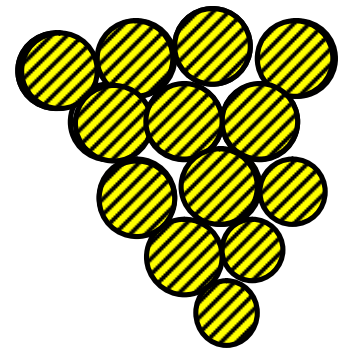
dwoinki



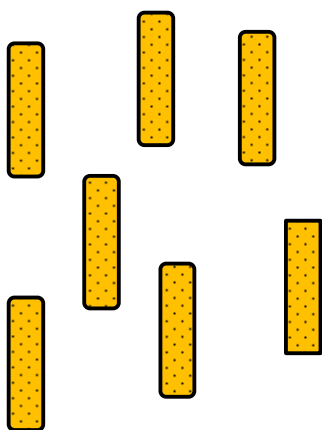
Paciorkowce



gronkowce



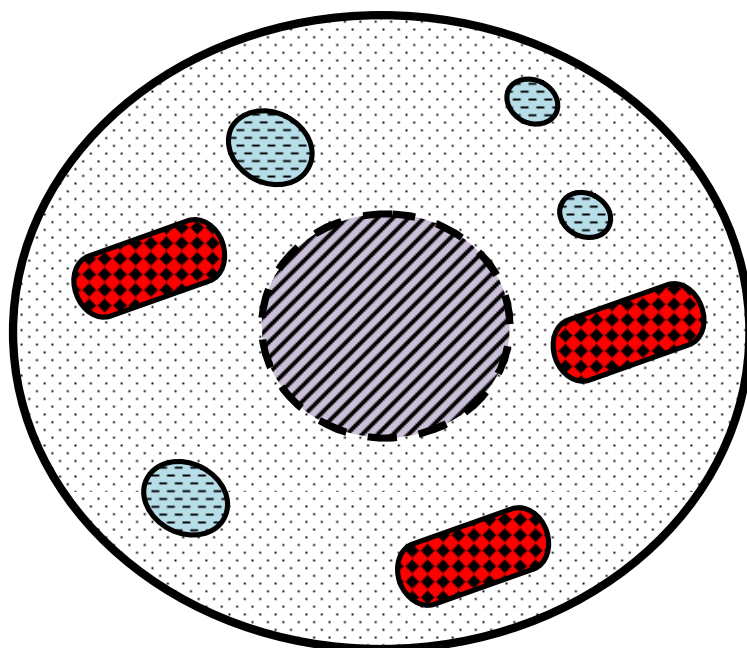
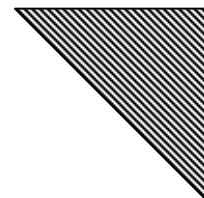
laseczki



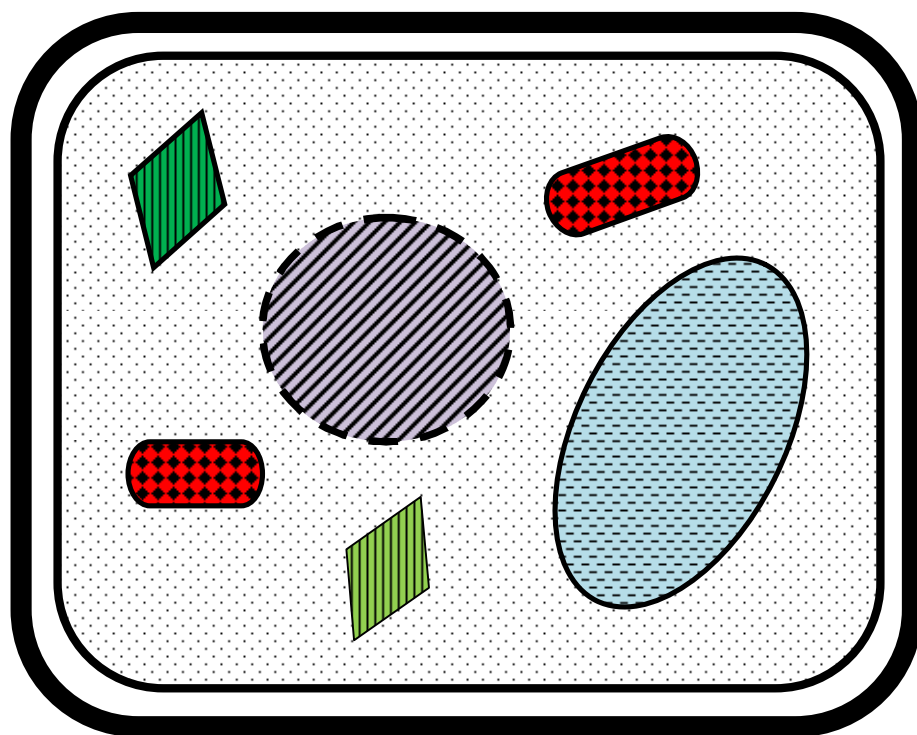
przecinkowce



komórka zwierzęca



komórka roślinna



**Królestwo:**Rośliny

**Podgromada:** Okrytozalążkowe

**Klasa:** Jednoliścienne

**Rząd:** Liliowce

**Rodzina:** Konwaliowate

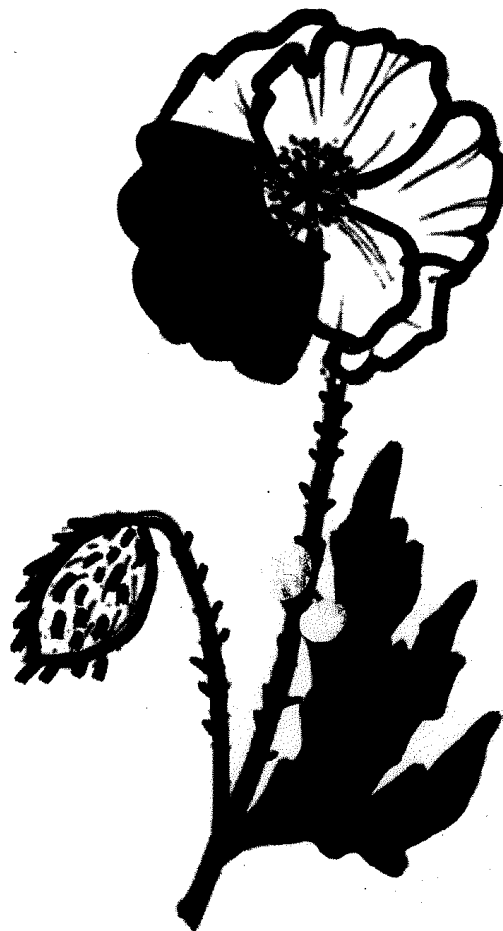
**Rodzaj:** Konwalia

**Gatunek:** *Konwalia majowa*



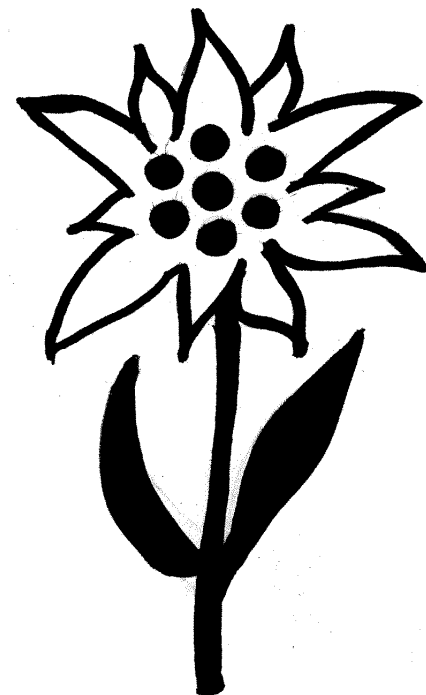
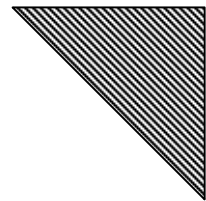
Według legendy konwalia powstała z łez Ewy wygnanej z raju. Jest narodowym kwiatem Finlandii. Stosuje się ją do leczenia chorób serca. Jest objęta częściową ochroną

**Królestwo:** Rośliny  
**Podgromada:** Okrytozalążkowe  
**Klasa:** dwuliścienne  
**Rząd:** Makowce  
**Rodzina:** Makowate  
**Rodaj:** Mak  
**Gatunek:** *Mak polny*

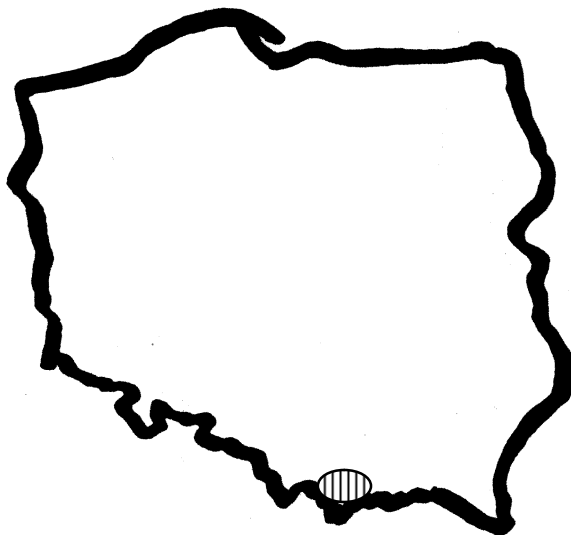


Liście pierzastodzielne, łodygi i liście owłosione. Najstarszy chwast polny, znany z epoki kamienia łupanego. Czerwone maki są symbolem krwi polskich żołnierzy poległych w bitwie pod Monte Cassino.

# Szarotka alpejska

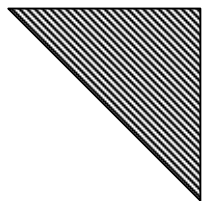


## Występowanie szarotki w Polsce – w Tatrach



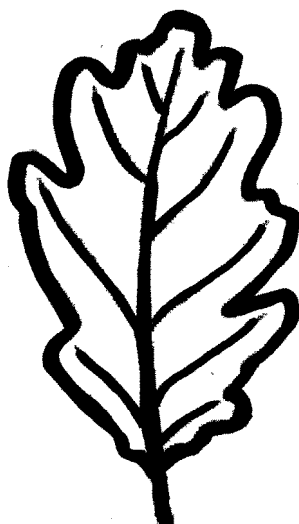
W Polsce pod ochroną.  
Nazywana przez górali: kocie łapki. Kwiat  
narodowy Szwajcarii.





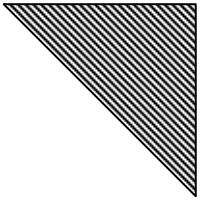
# Kształty blaszek liściowych i unerwienie (cz.1):

## 1. Dąb bezszypułkowy



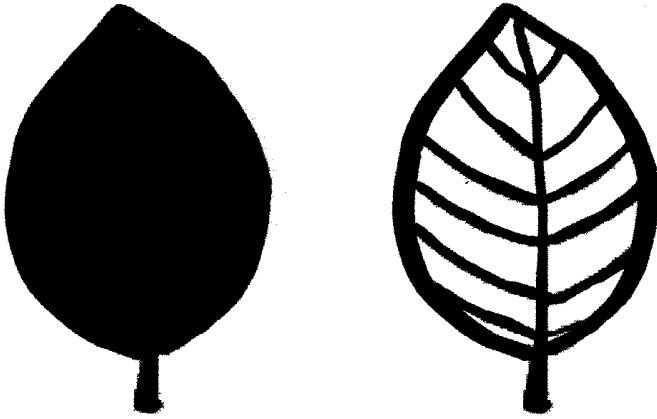
## 2. Mniszek lekarski



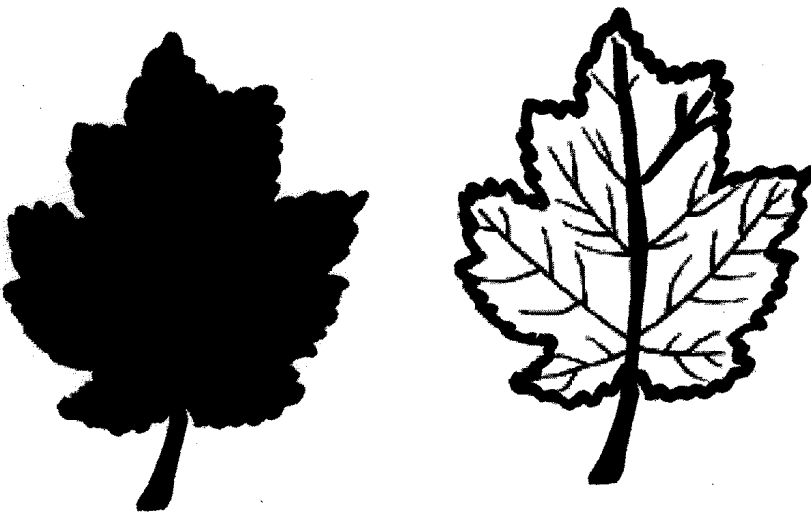


# Kształty blaszek liściowych i unerwienie (cz.1):

1. Buk pospolity

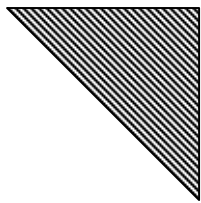


2. Porzeczką



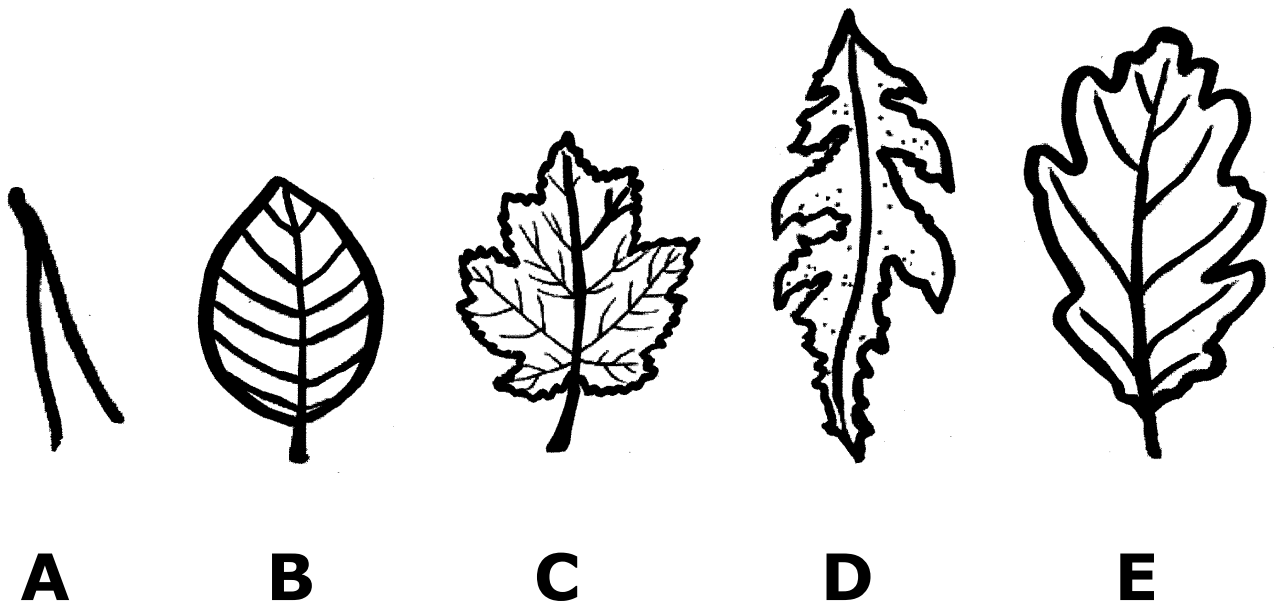
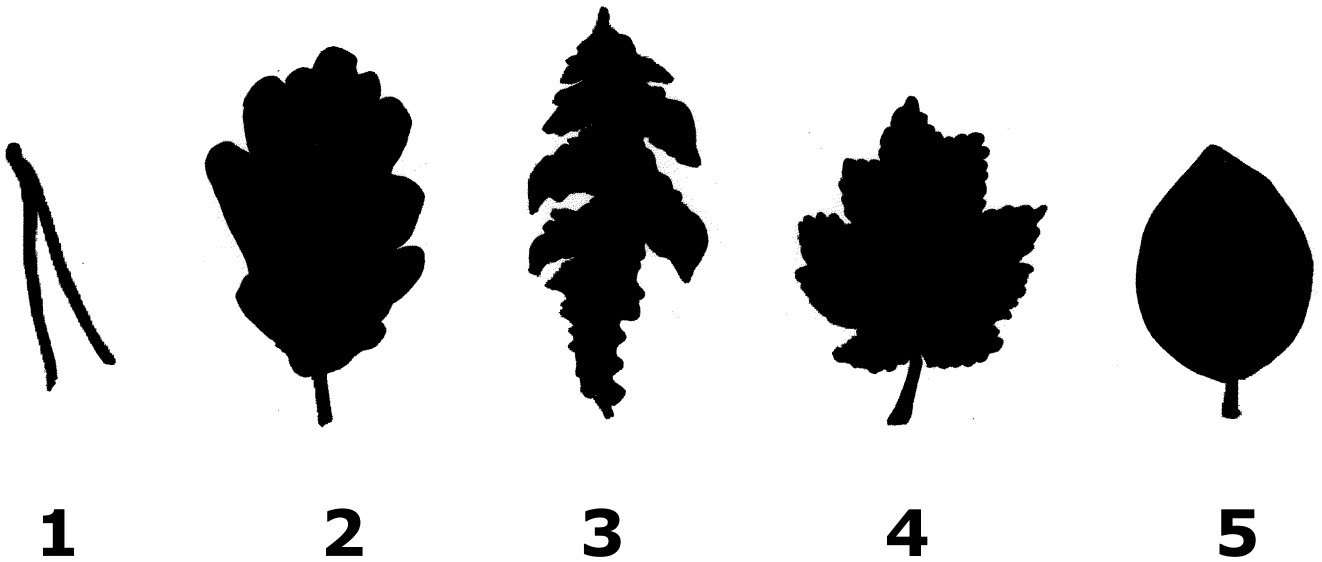
3. Sosna zwyczajna



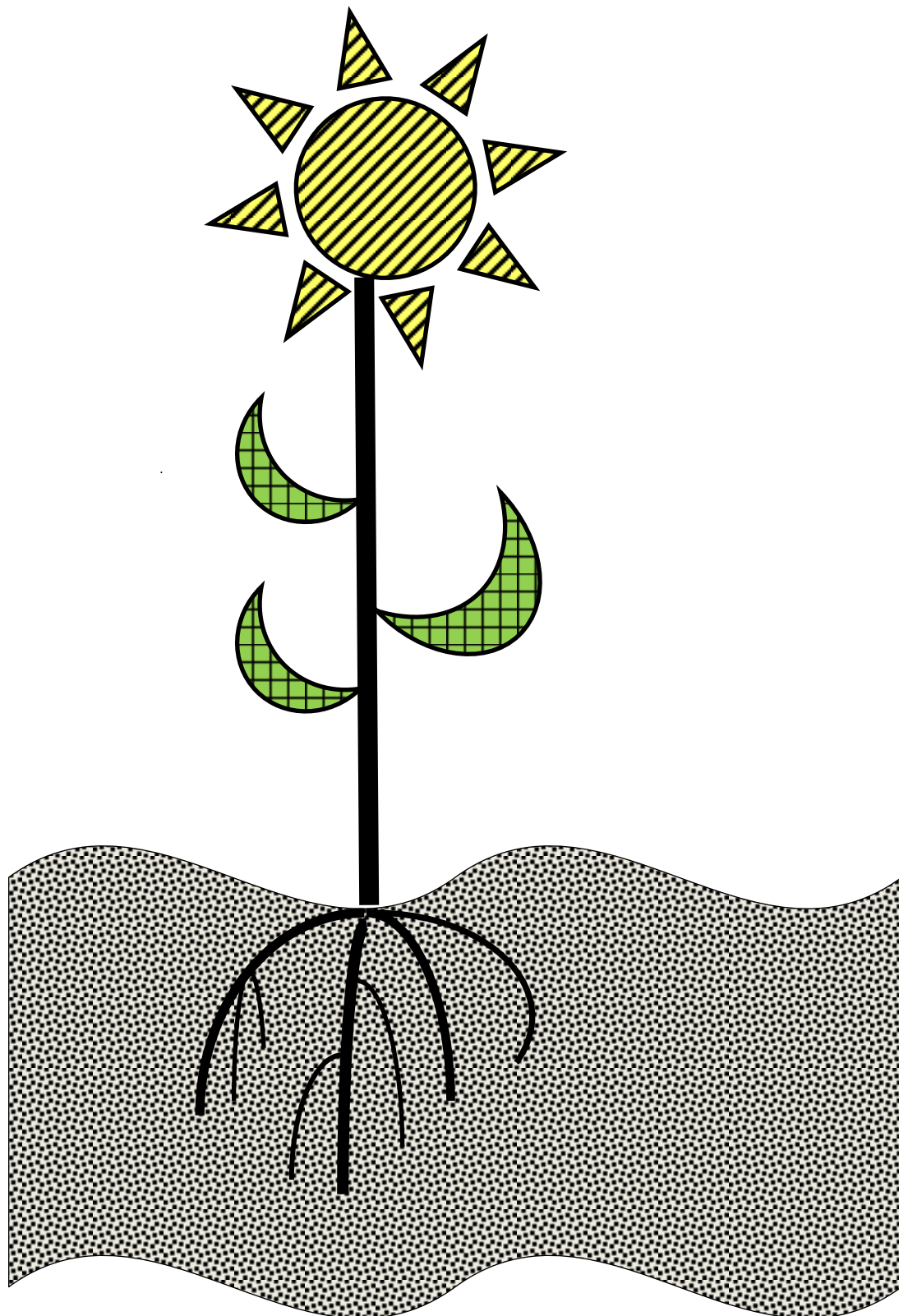
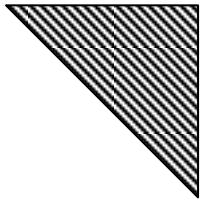


Rozpoznaj na podstawie kształtu blaszek i unerwienia gatunki roślin, z których pochodzą liście.

Dobierz parami liście należące do tego samego gatunku.

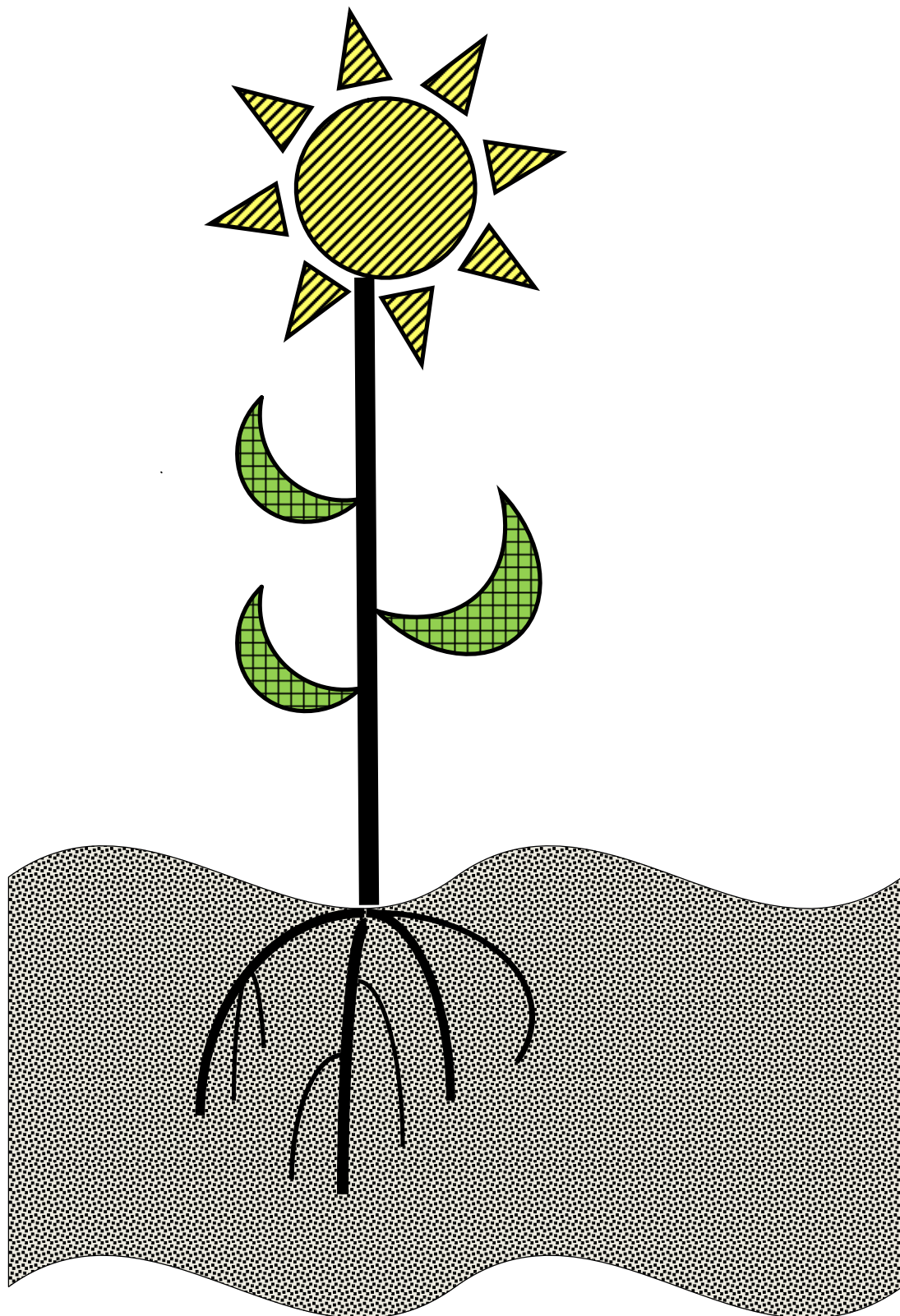
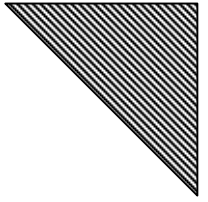


# Budowa rośliny okrytonasiennej.



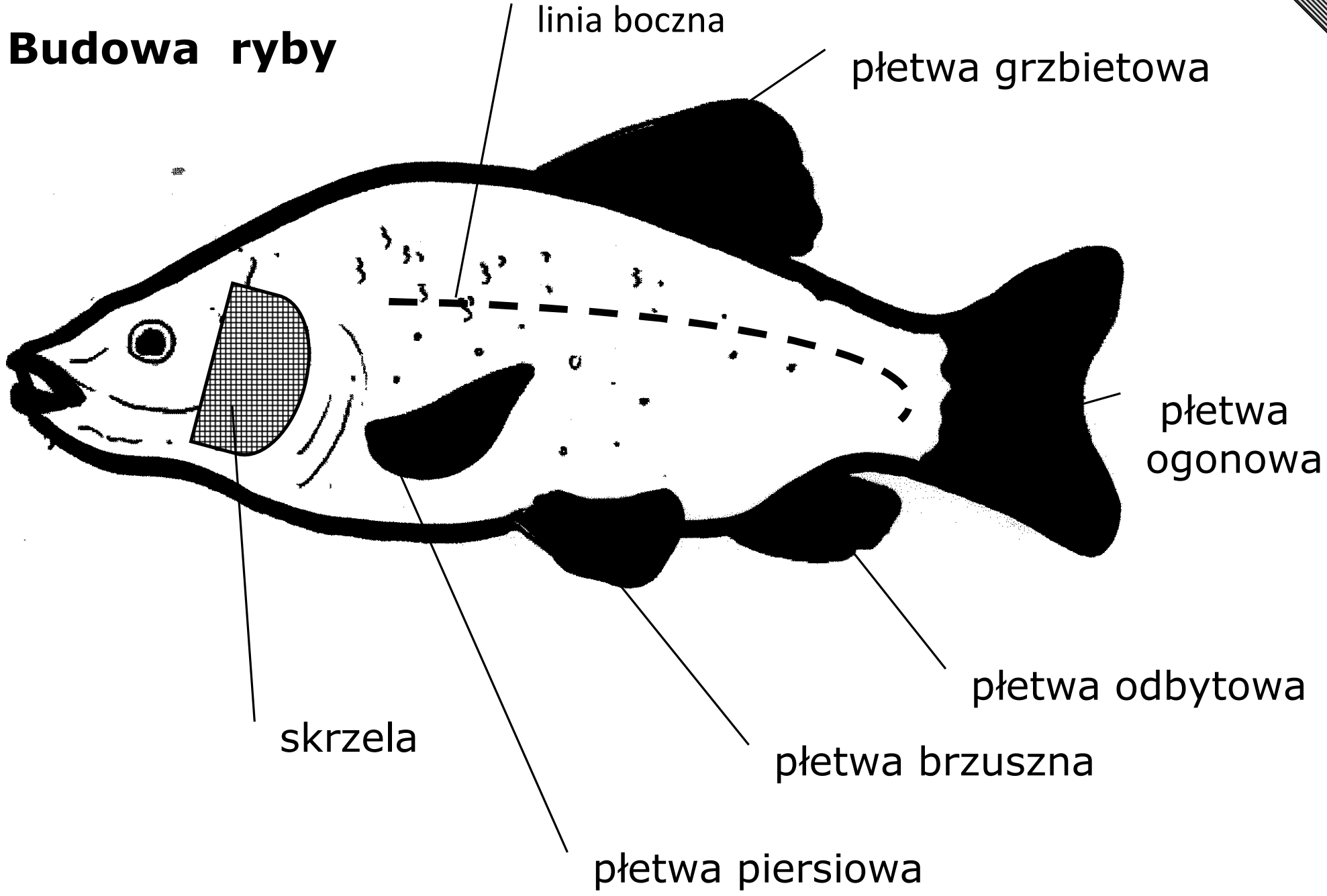
Wskaż i nazwij organy nadziemne i podziemne rośliny.

# Budowa rośliny okrytonasiennej.



Wskaż i nazwij organy nadziemne i podziemne rośliny.

# Budowa ryby



linia boczna

płetwa grzbietowa

płetwa ogonowa

płetwa odbytowa

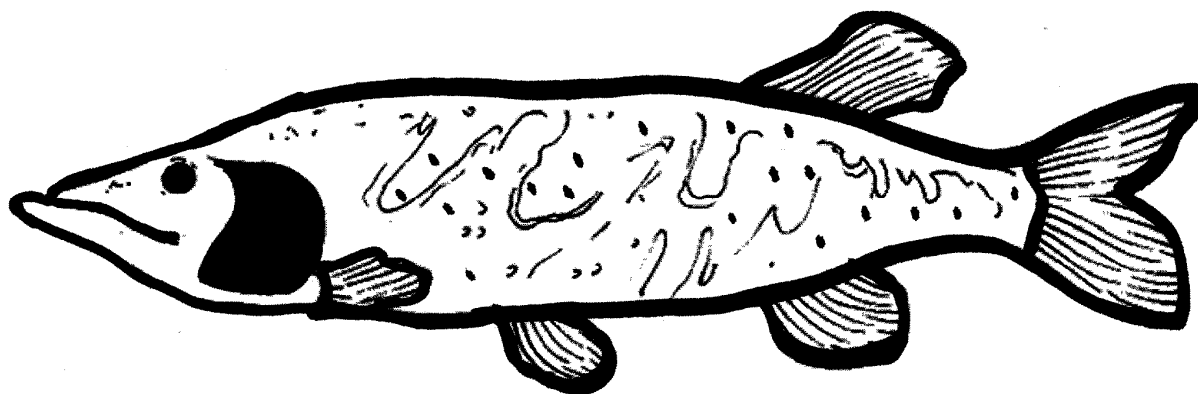
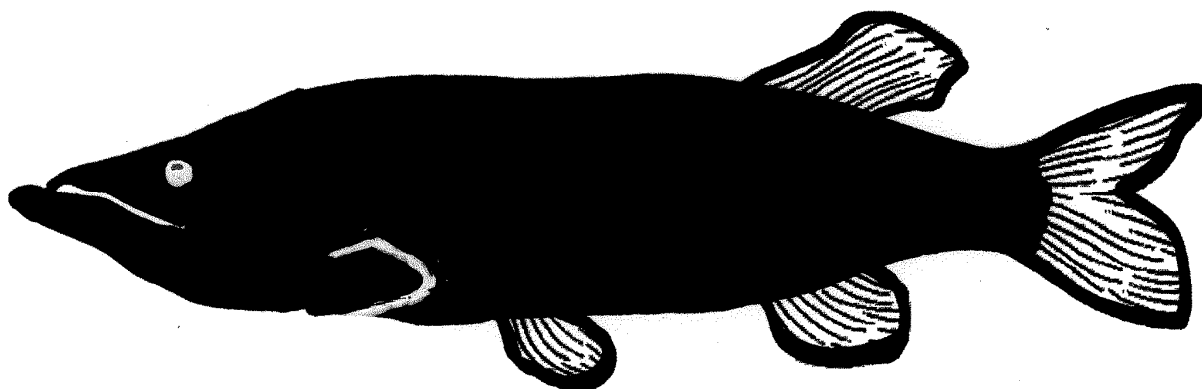
płetwa brzuszna

płetwa piersiowa

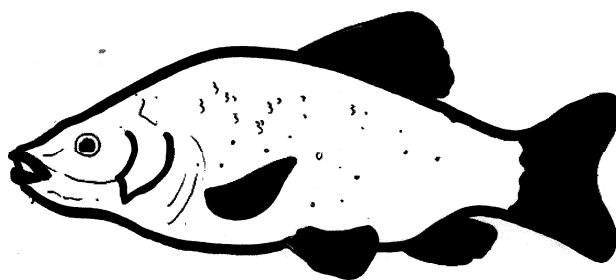
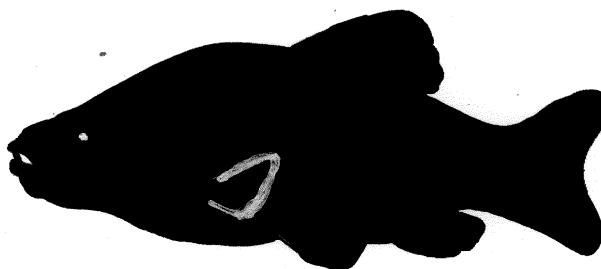
skrzela

# Ryby słodkowodne w Polsce

## Szczupak

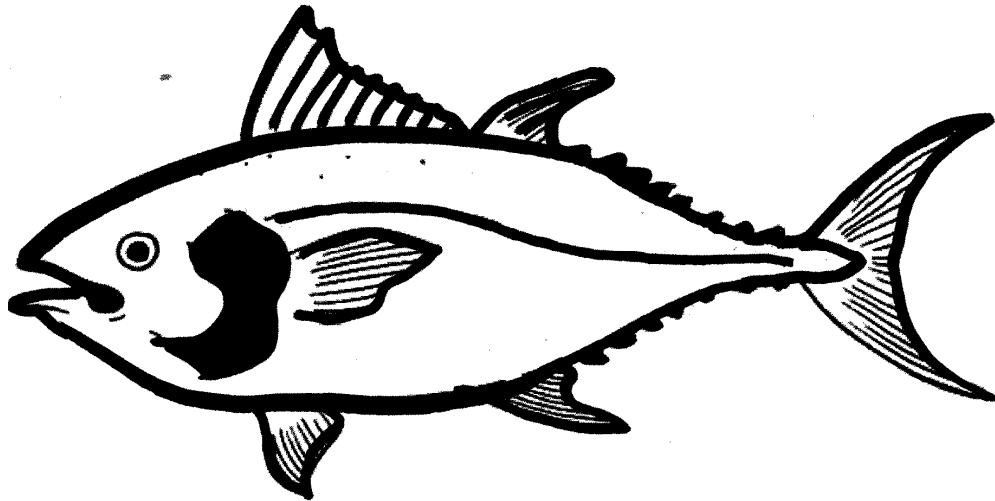
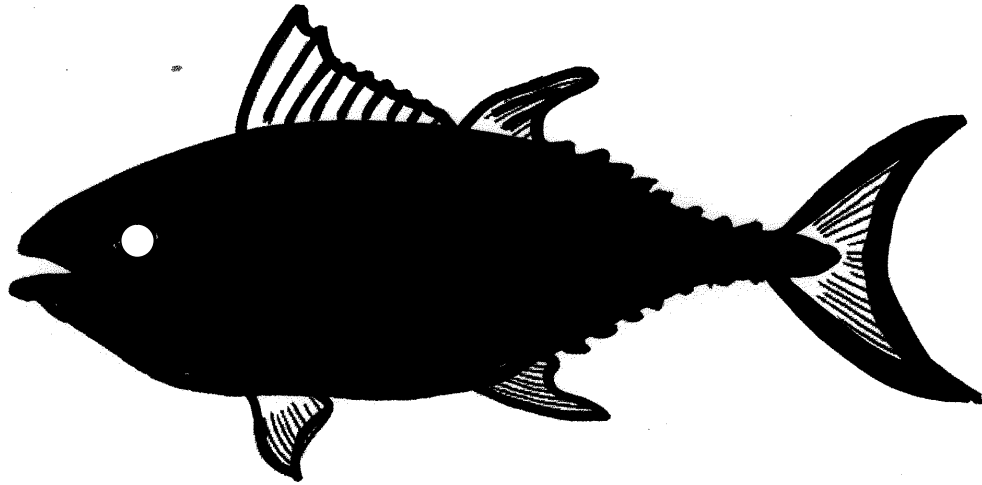


Lin

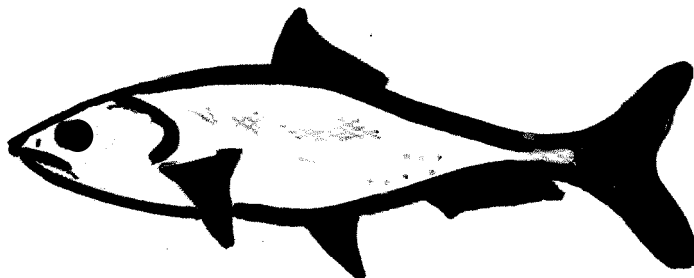
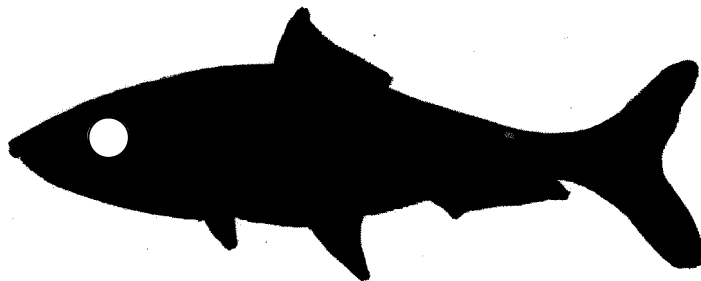


# Ryby morskie

Tuńczyk

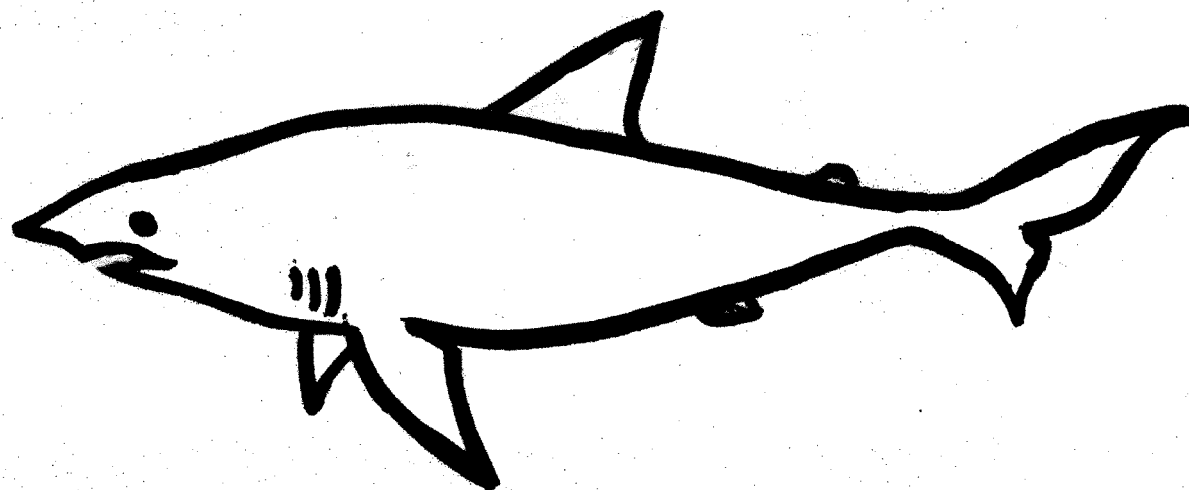
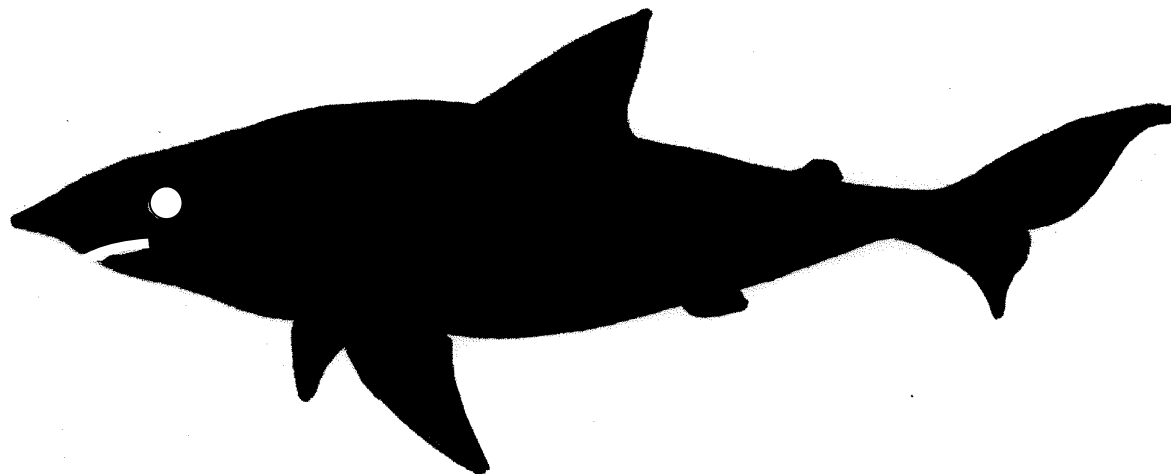
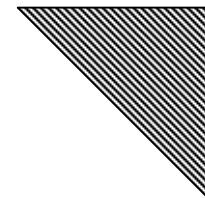


Sardynka

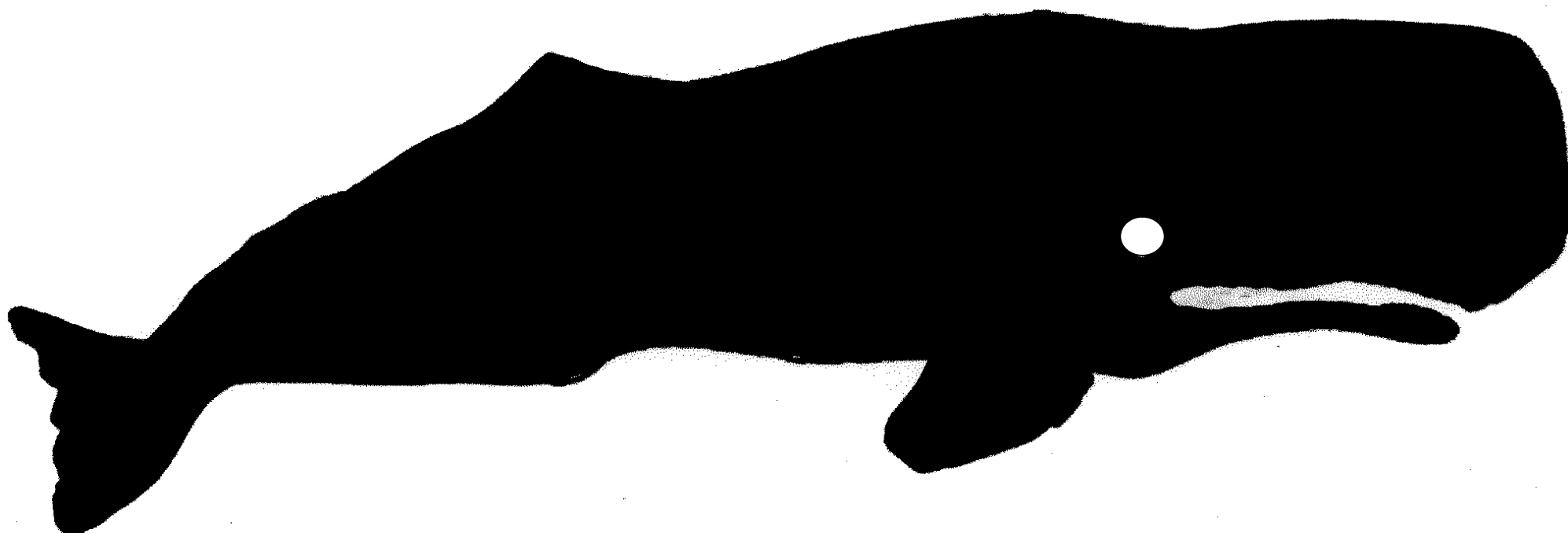
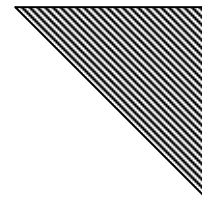




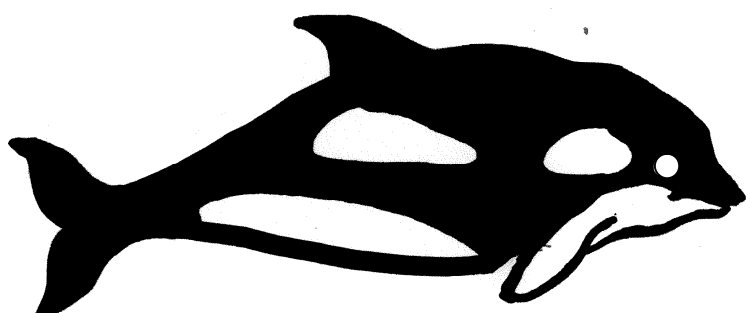
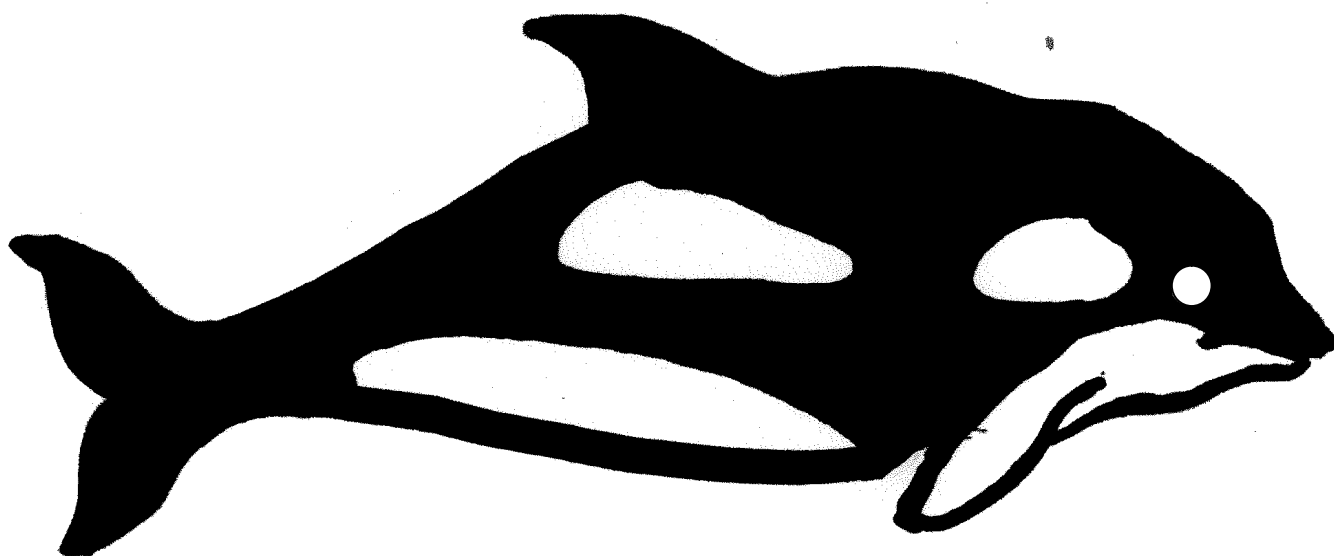
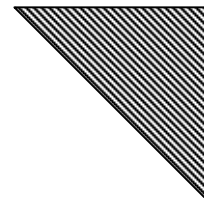
Rekin – ryba chrzęstnoszkieletowa, morska, drapieżna



# Kaszalot – największy ssak na świecie



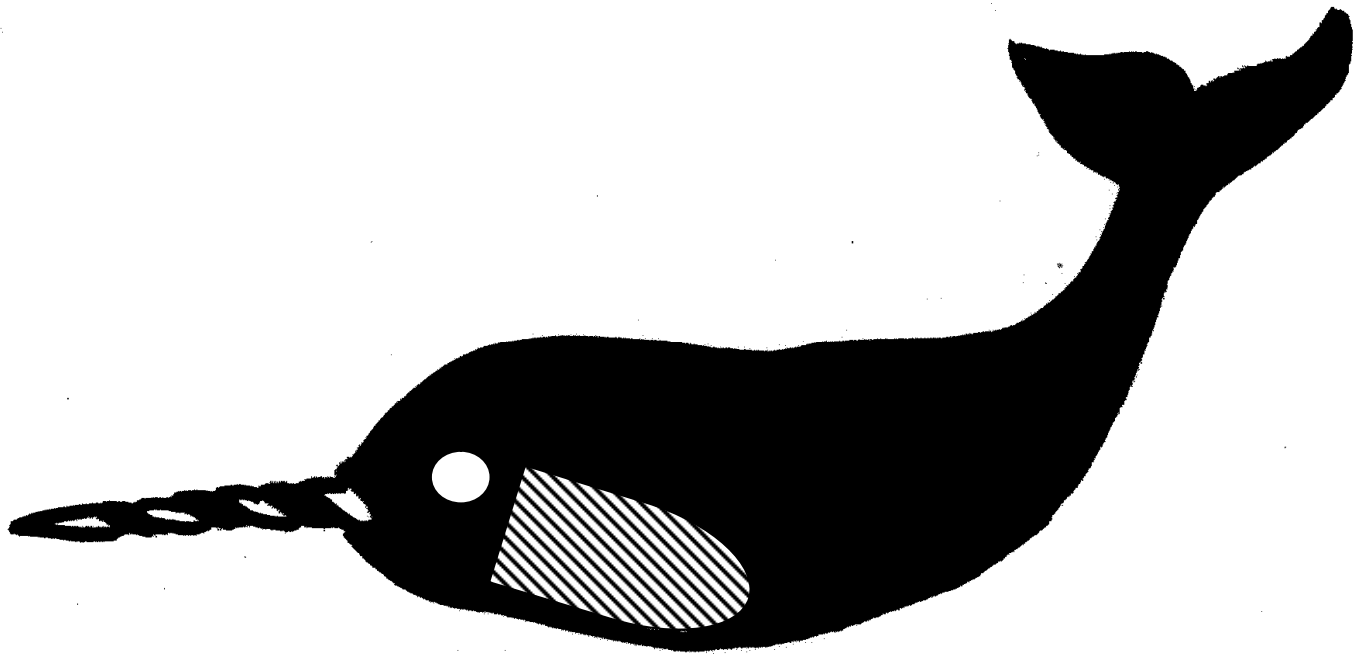
# Orki



Największe **ssaki** z rodziny **delfinowatych**. Żyją w grupach 5-50 osobników, przewodzi najstarsza samica.

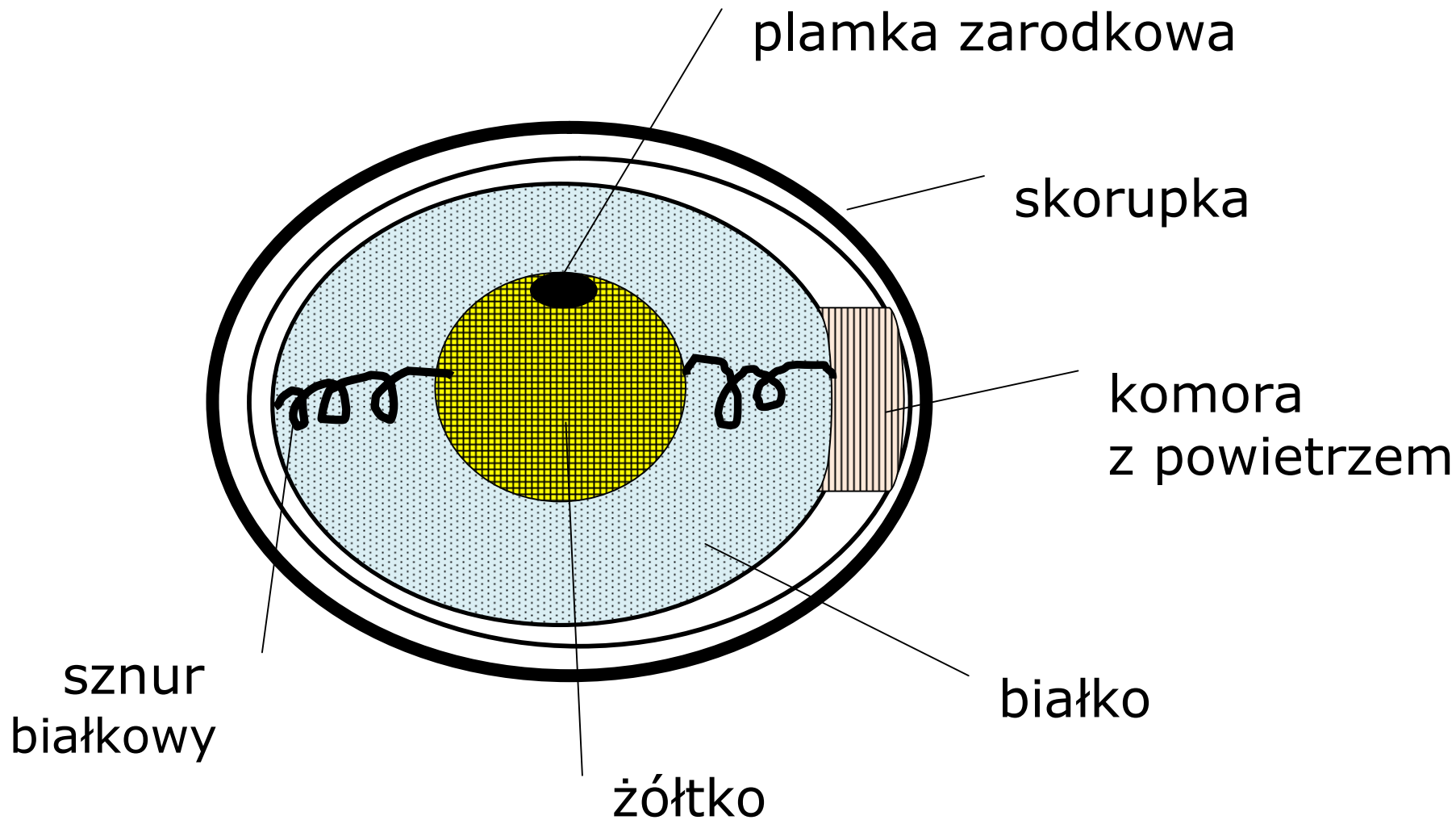
Orki mają 7 m długości, ciąża trwa rok, noworodek ma 2 m długości i może ważyć nawet tonę. Orki żyją 50 do 90 lat. Poruszają się z prędkością 60 km na godzinę.

# Narwal



Żyje w wodach strefy arktycznej. Jest ssakiem, należy do waleni. Jego cechą charakterystyczną jest pojedynczy, spiralnie skręcony cios wyrastający z górnej szczęki. Może dorastać on nawet do 3 m długości. Jego funkcją jest rozbijanie pokrywy lodowej w celu zaczerpnięcia powietrza oraz odbieranie wielu informacji o zmieniającym się otoczeniu (jest dobrze unerwiony).

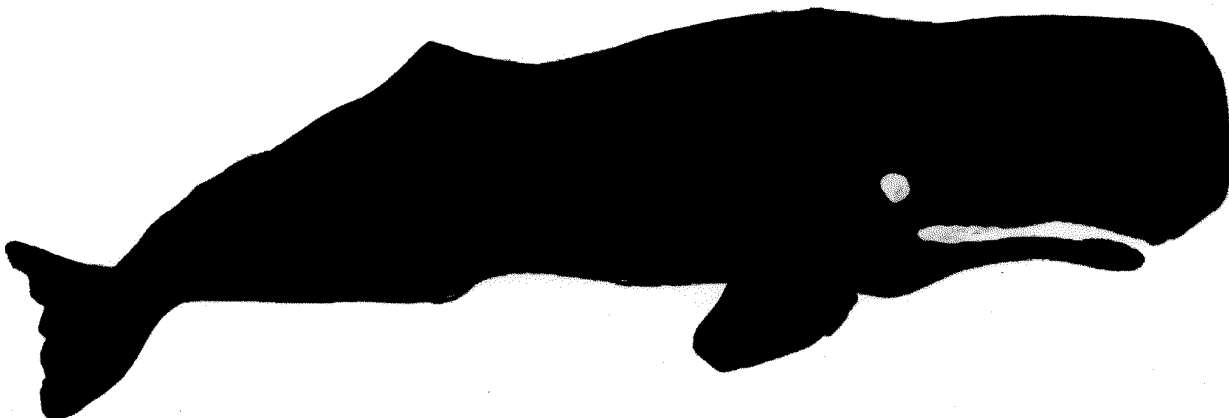
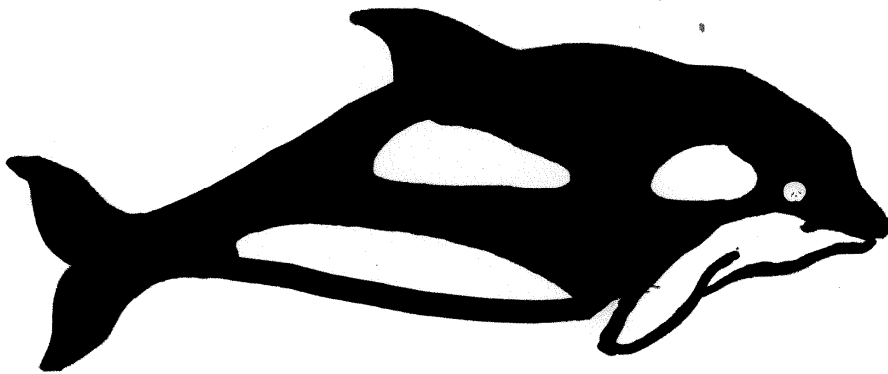
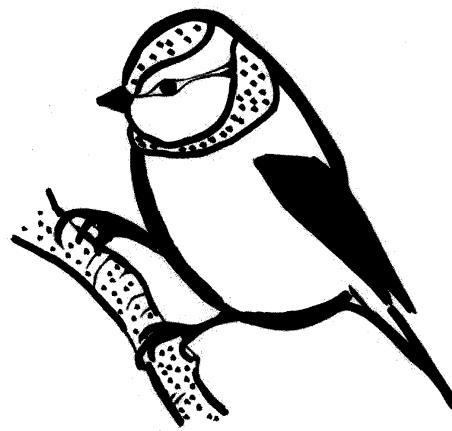
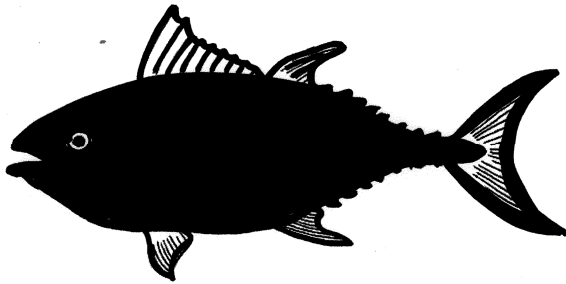
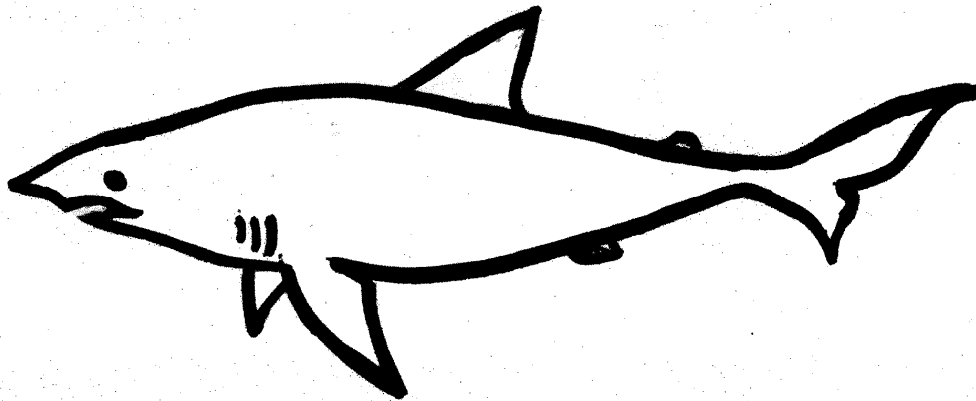
# Budowa jaja



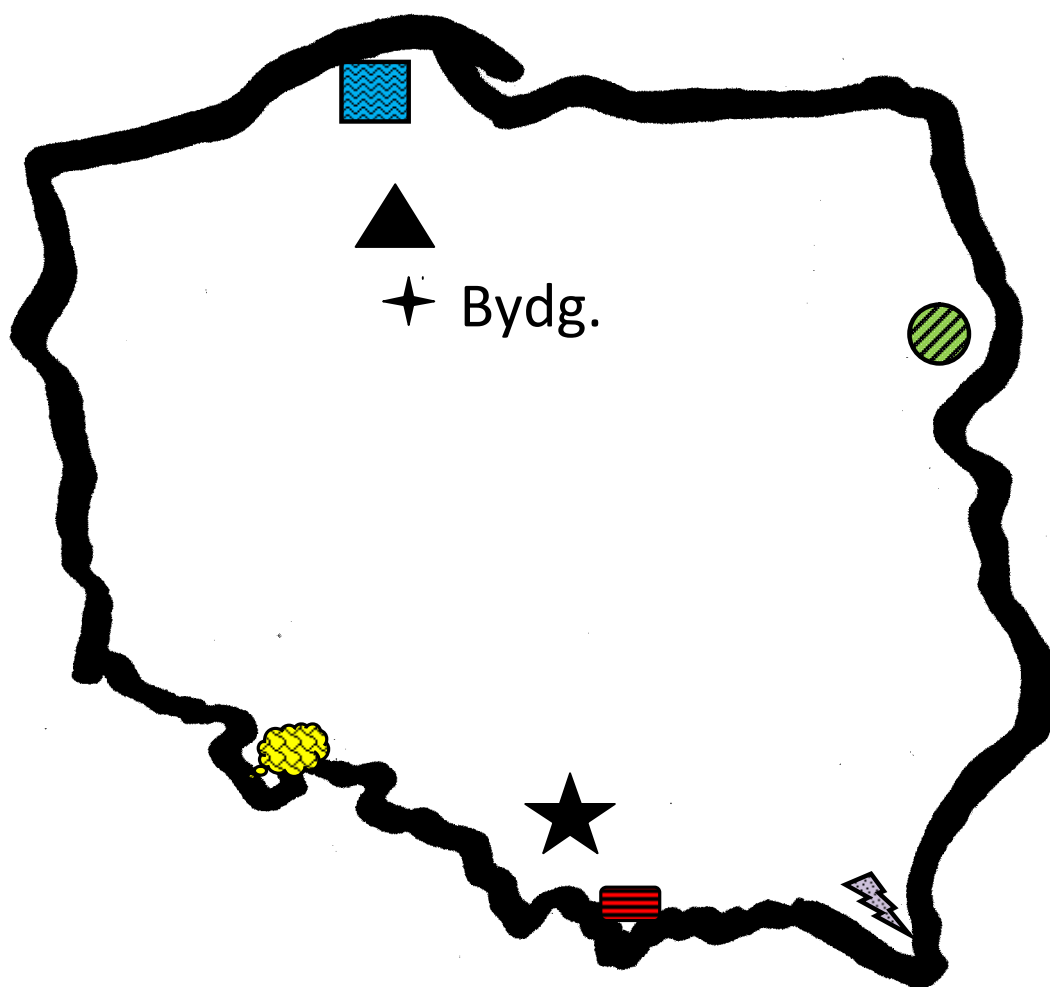
Z plamki zarodkowej rozwinię się całe ciało młodego ptaka










Rozpoznaj gatunki zwierząt. Podaj do jakich grup systematycznych należą.



# Parki Narodowe w Polsce

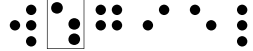
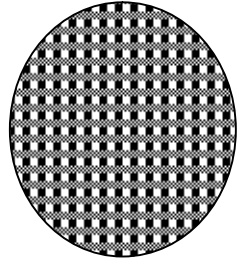
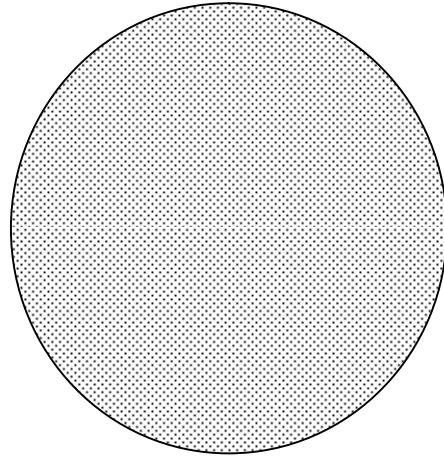
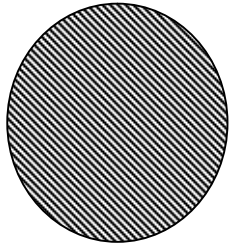
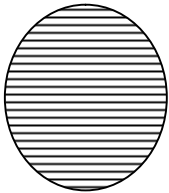
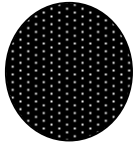
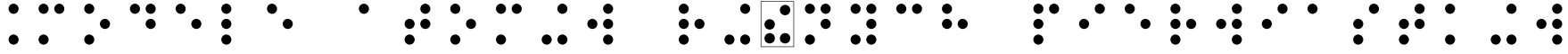
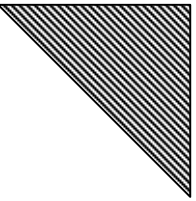


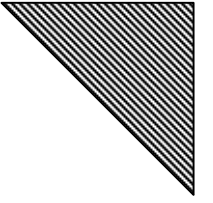
-  Park Narodowy Bory Tucholskie
-  Słowiński Park Narodowy
-  Białowieski Park Narodowy
-  Tatrzański Park Narodowy
-  Bieszczadzki Park Narodowy
-  Babiogórski Park Narodowy
-  Karkonoski park Narodowy

Chemia

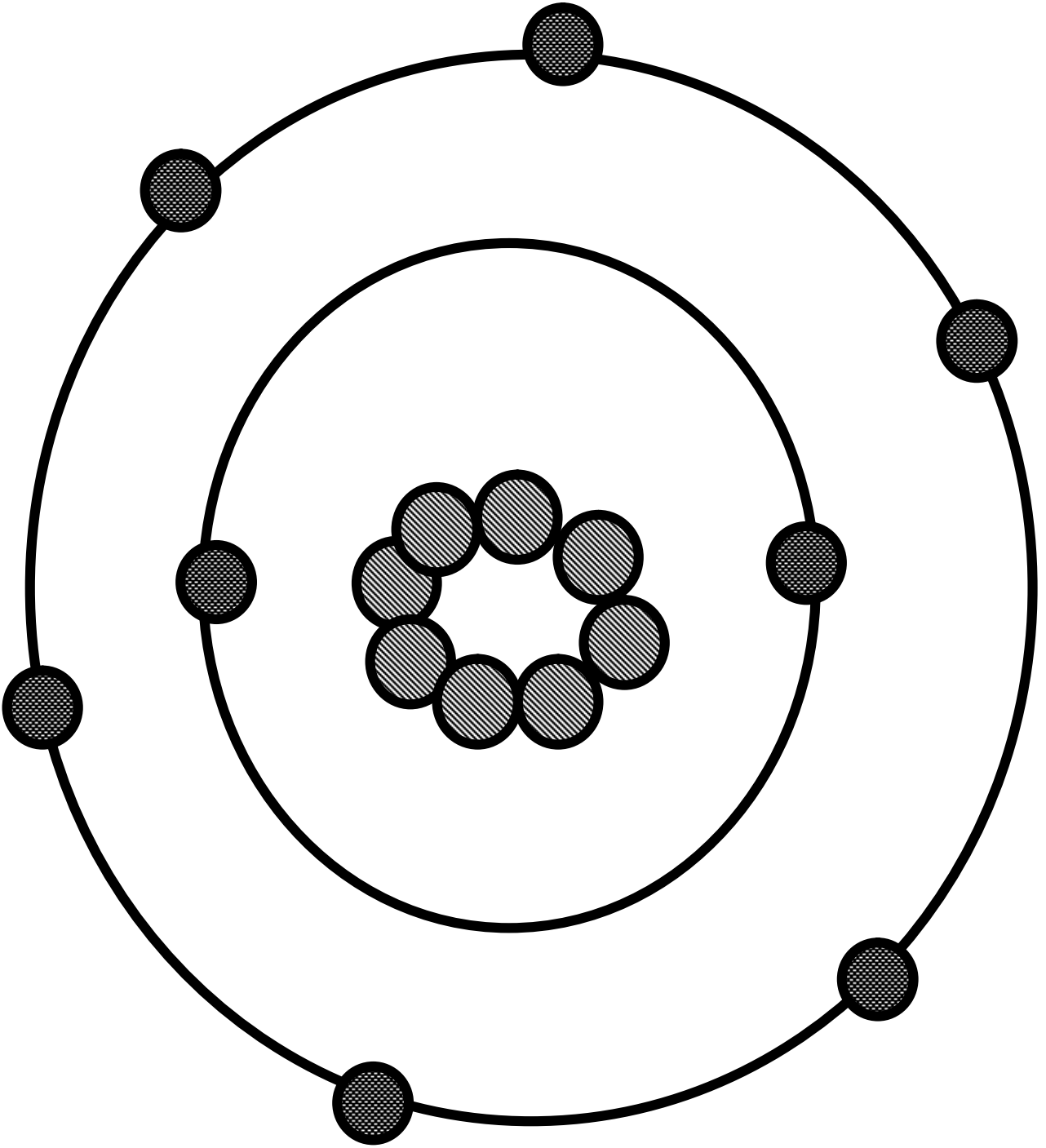


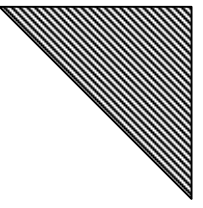




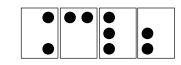
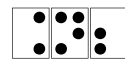
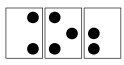
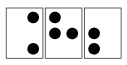
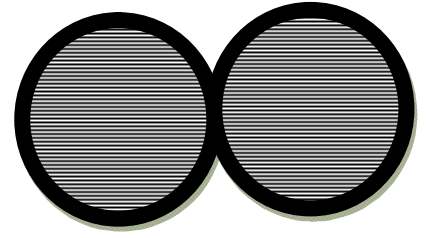
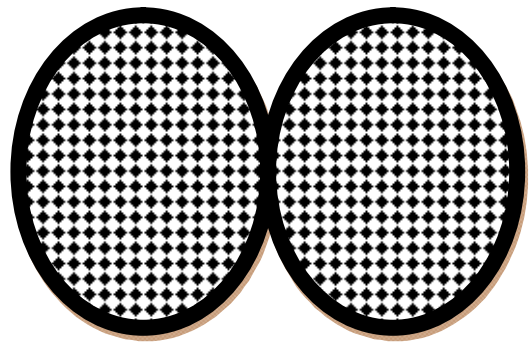
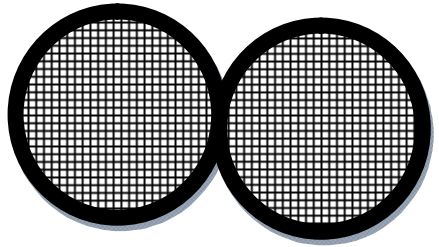
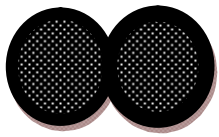


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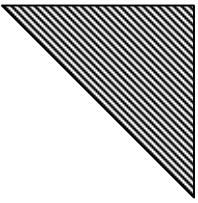




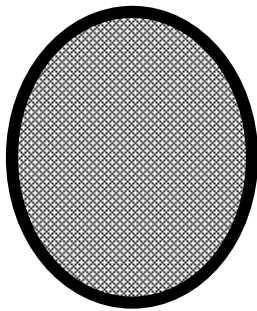
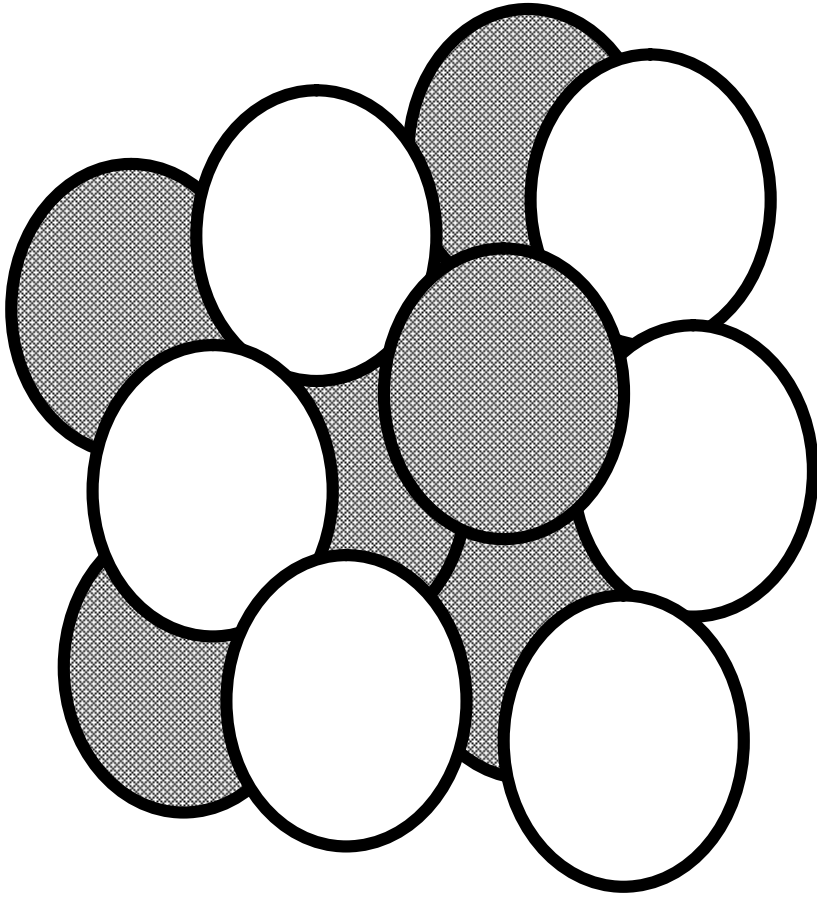
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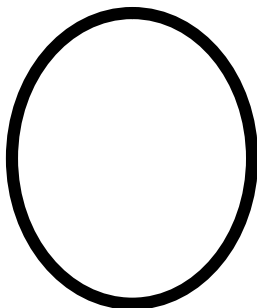




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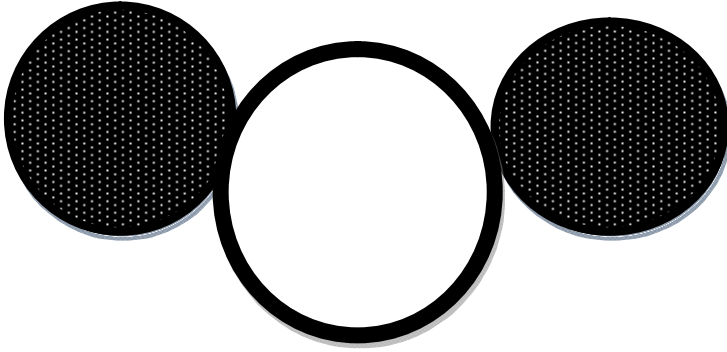
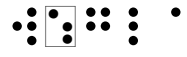
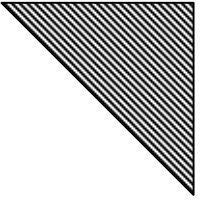


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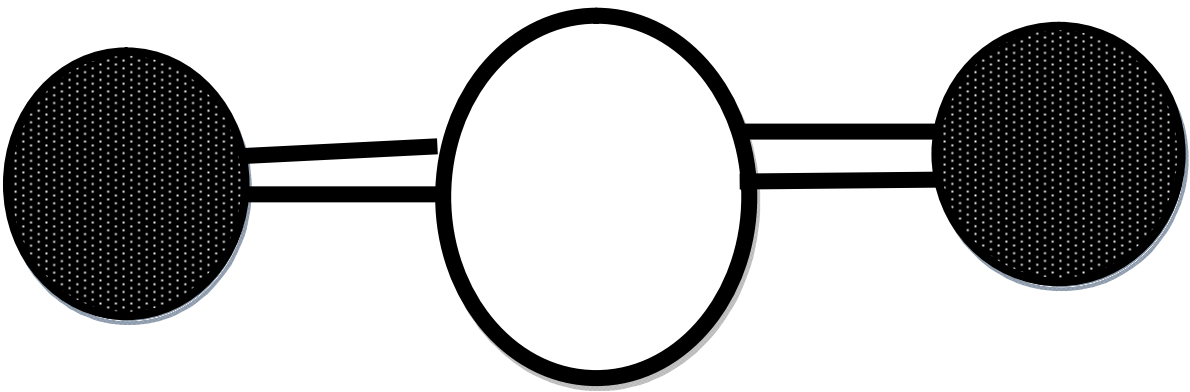


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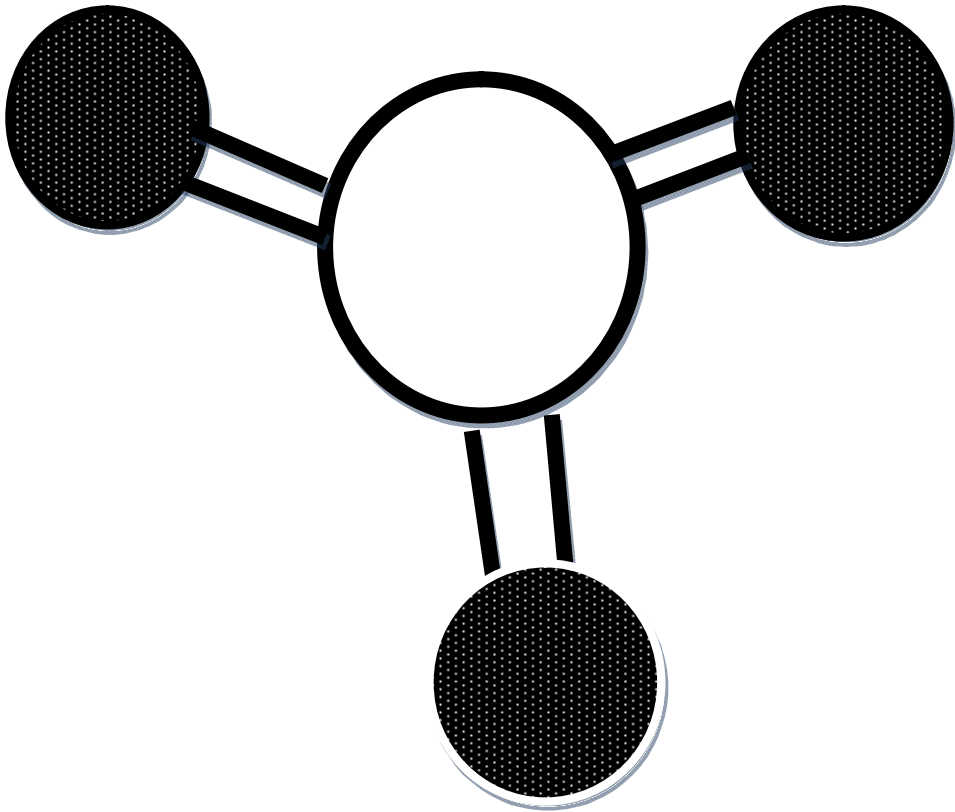
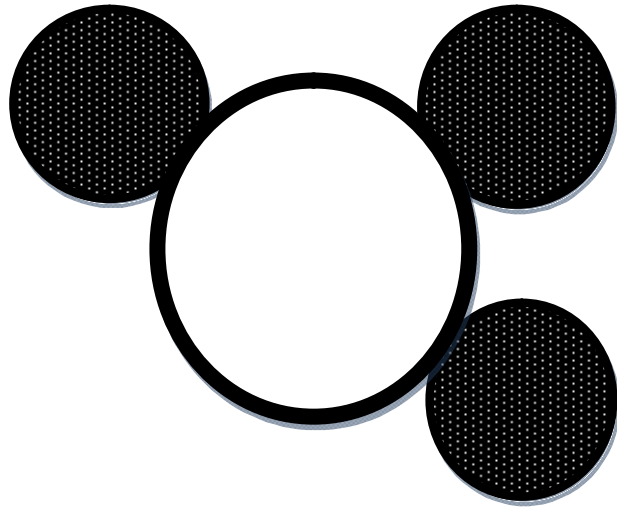
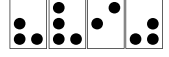
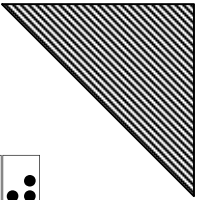




1







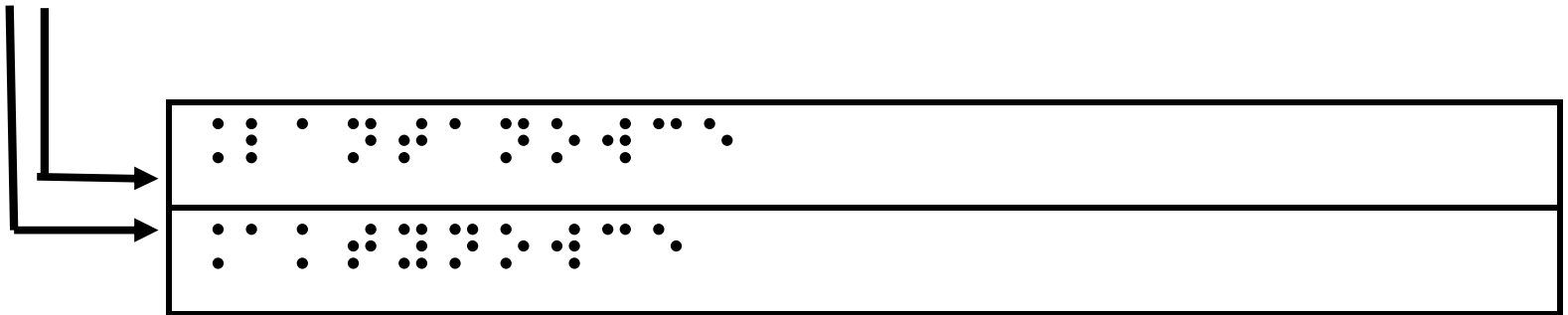
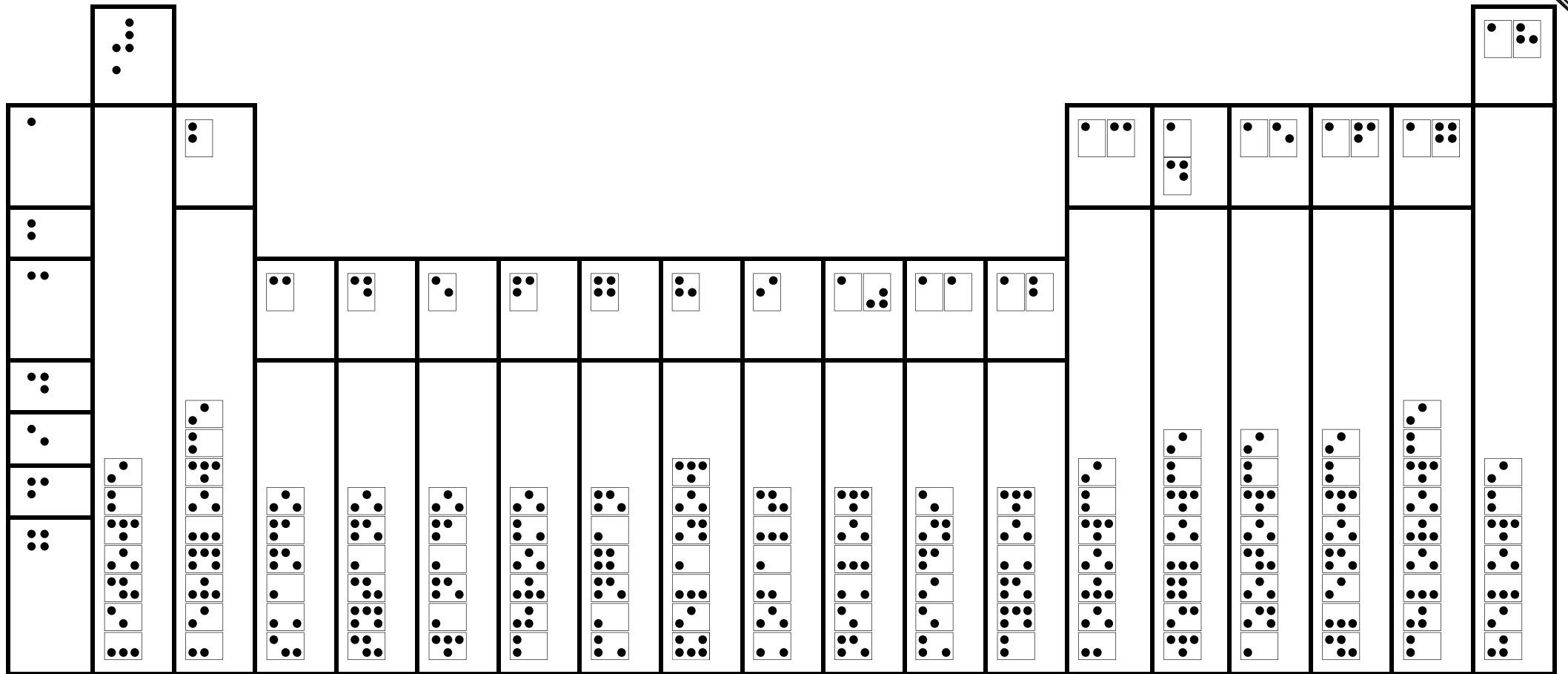








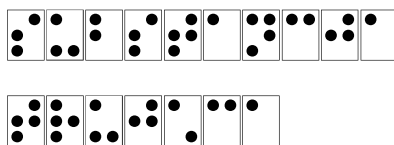
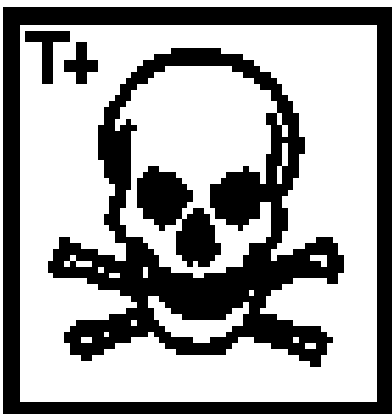
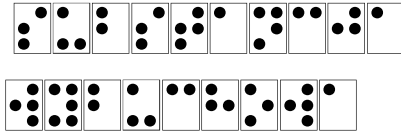
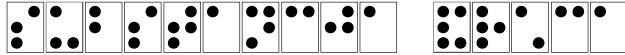
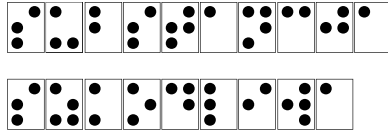
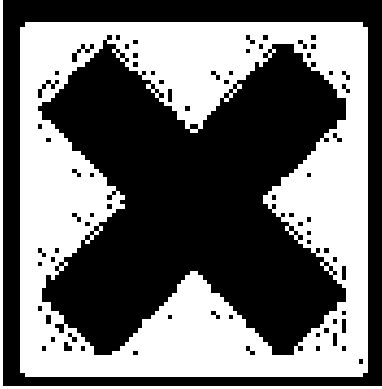
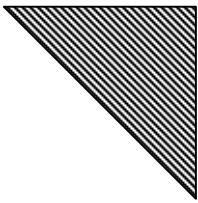


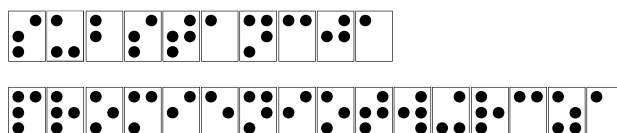
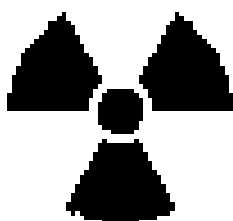
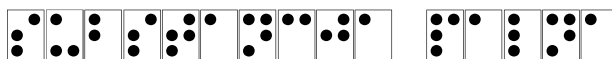
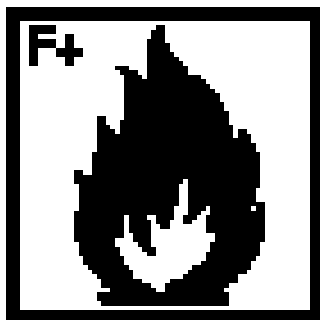
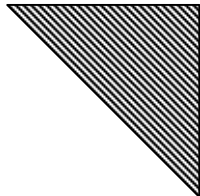






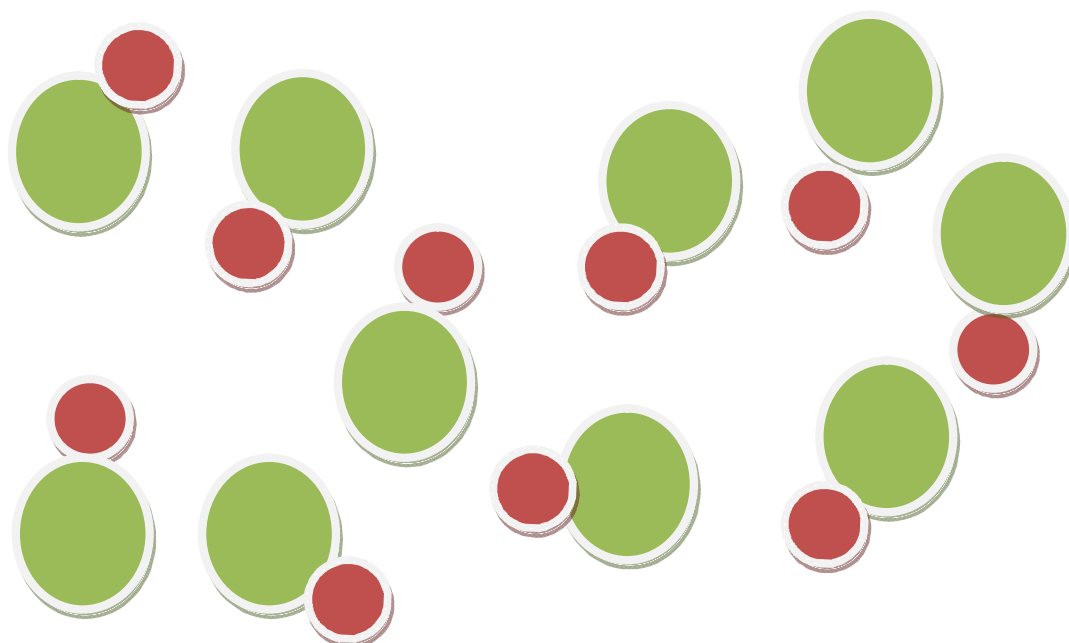
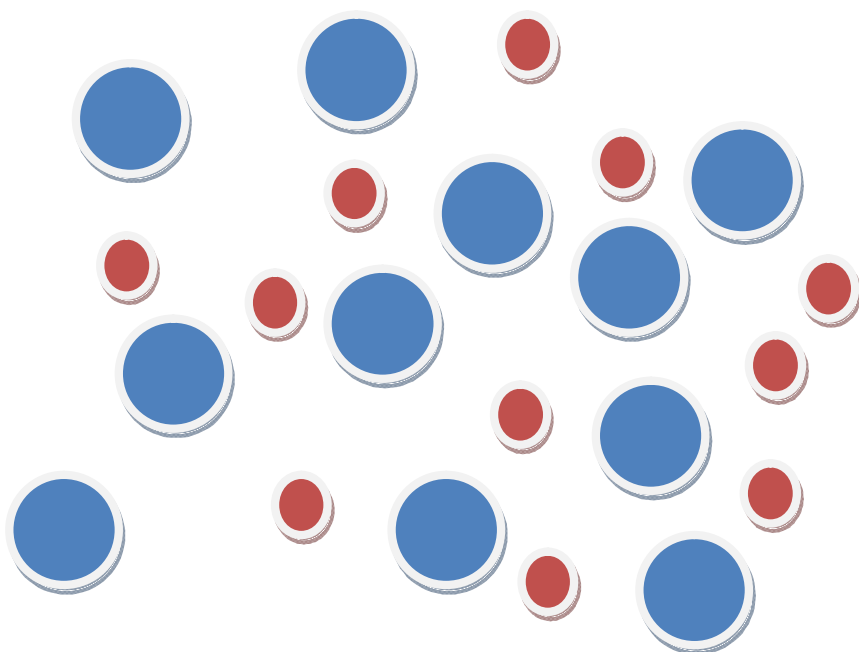
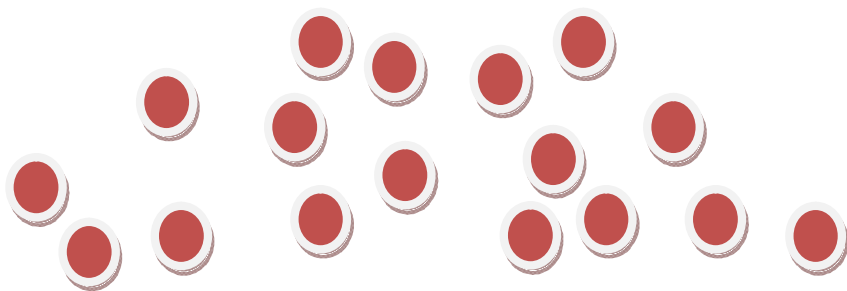
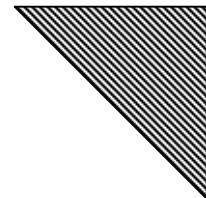




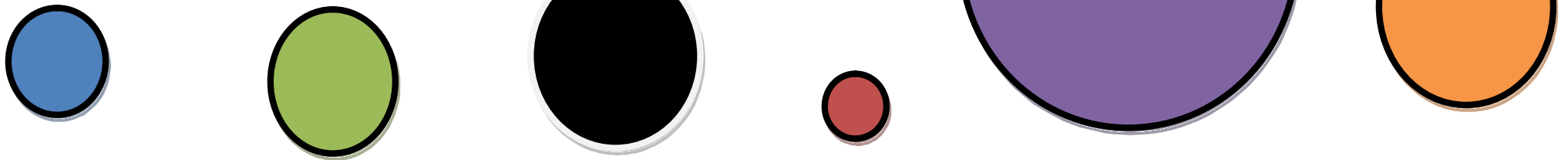
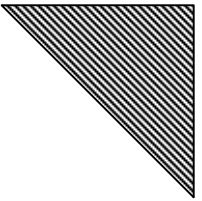




# Atomy i cząsteczki



# Modele atomów różnych pierwiastków



tlen

azot

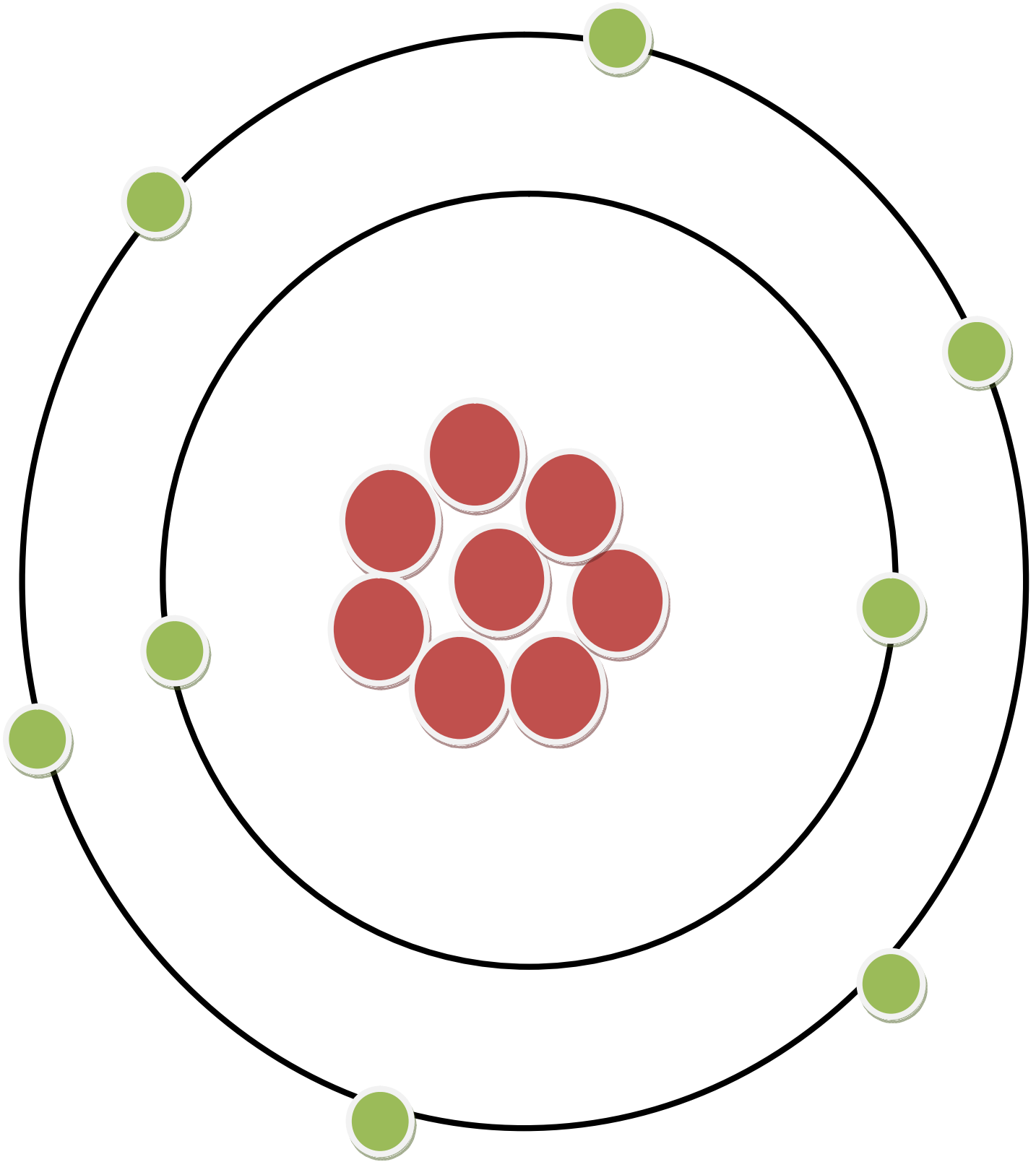
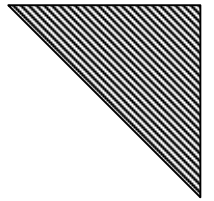
w giel

wodór

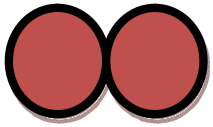
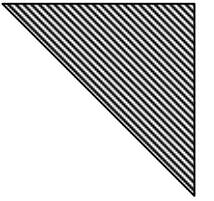
sód

siarka

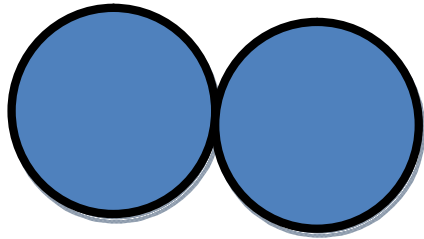
# Model atomu tlenu



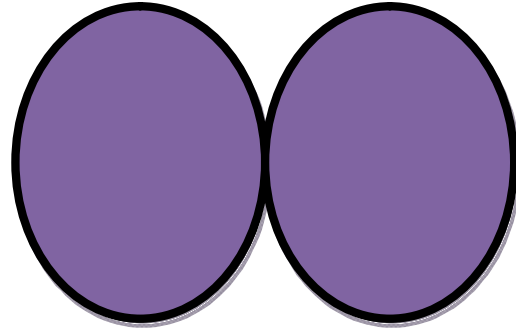
Cząsteczki dwuatomowe gazów



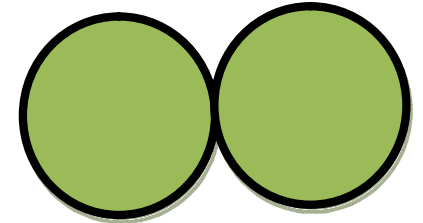
$H_2$



$O_2$



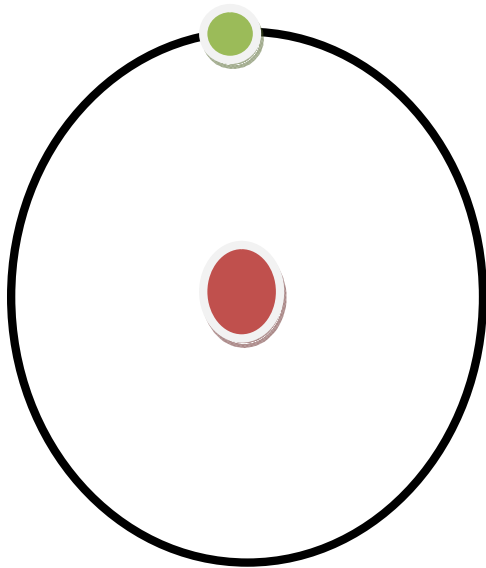
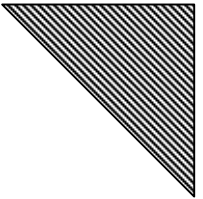
$N_2$



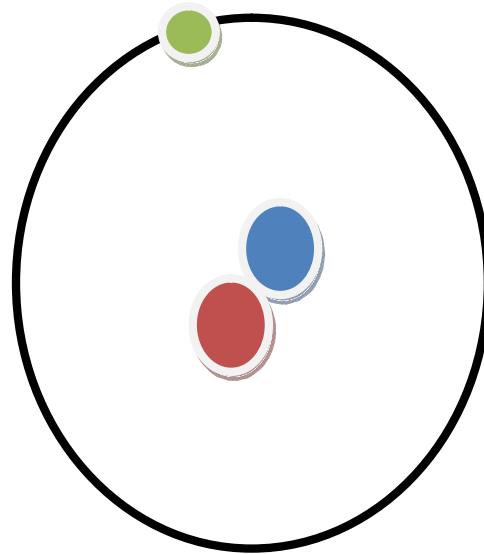
$Cl_2$



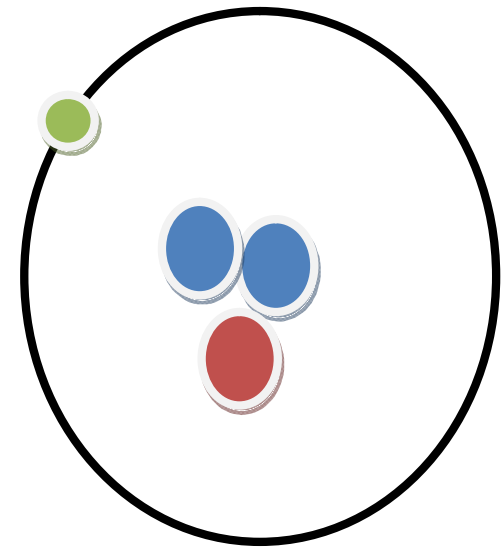
# Izotopy wodoru



**Prot**

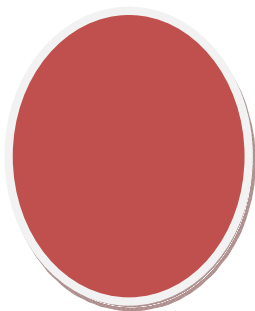
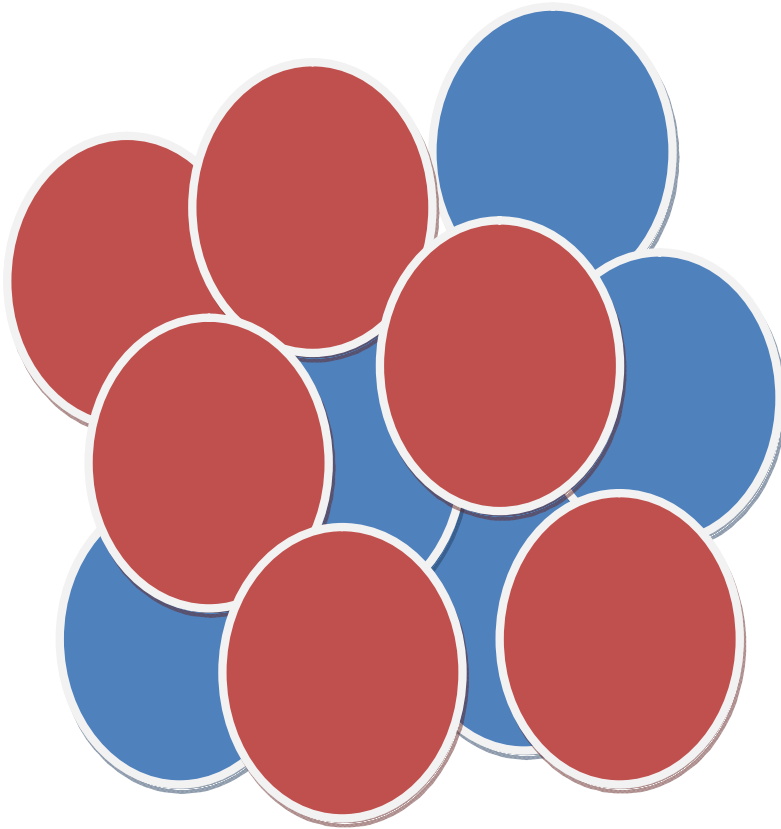
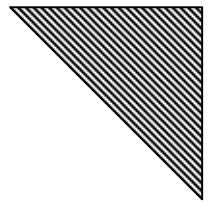


**deuter**

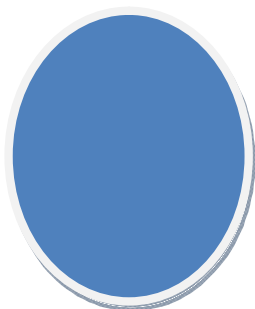


**tryt**

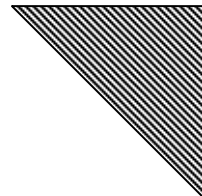
# J dro atomowe



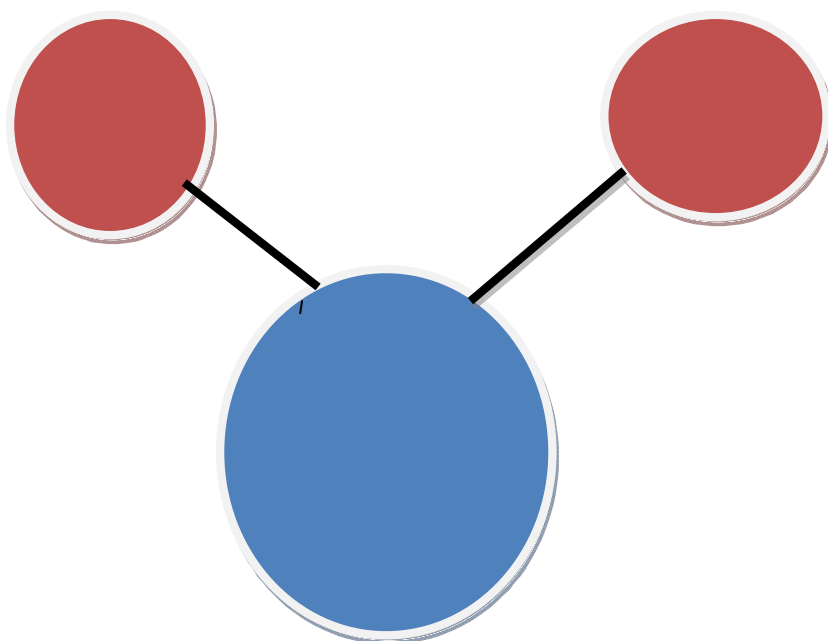
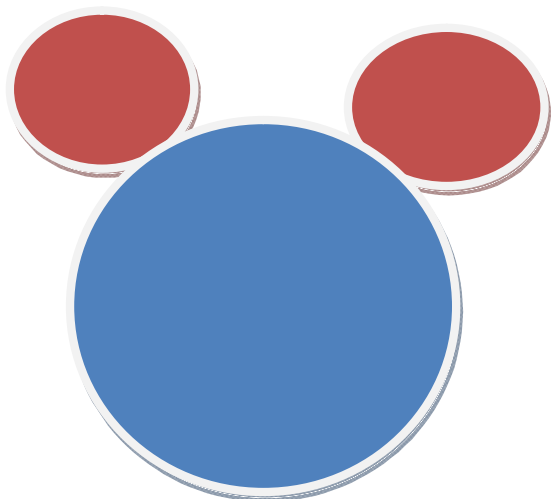
**proton**

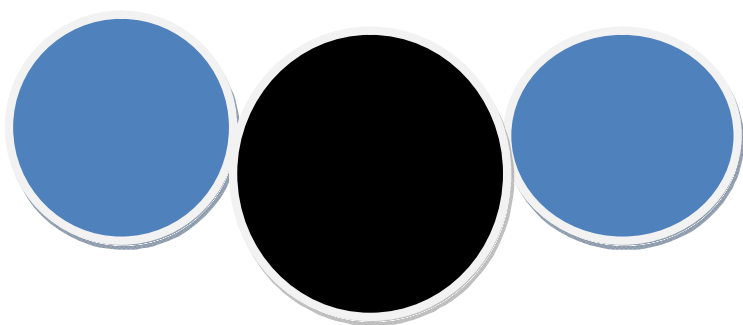
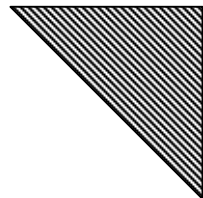


**neutron**

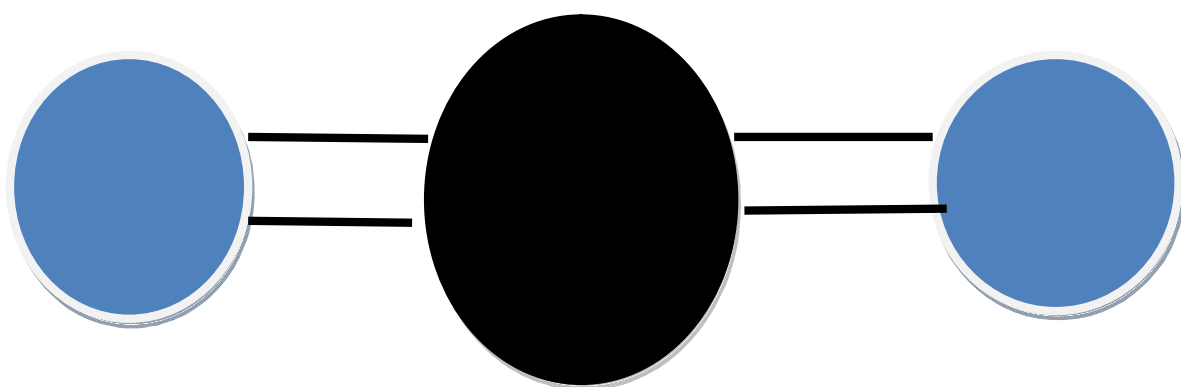


# Cząsteczka wody



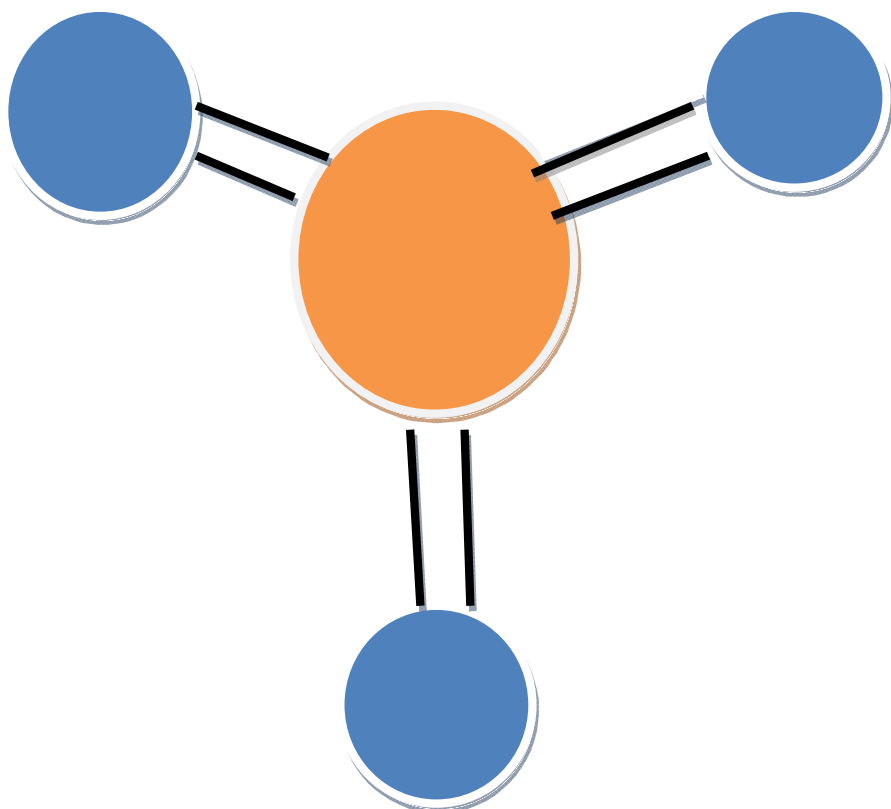


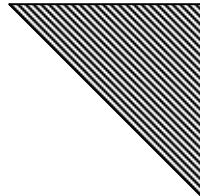
1



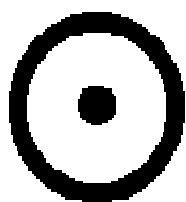
Tlenek węgla(IV)

# Tlenek siarki(VI)





## Dawne oznaczenia pierwiastków



złoto



srebro



rtęć



Miedź

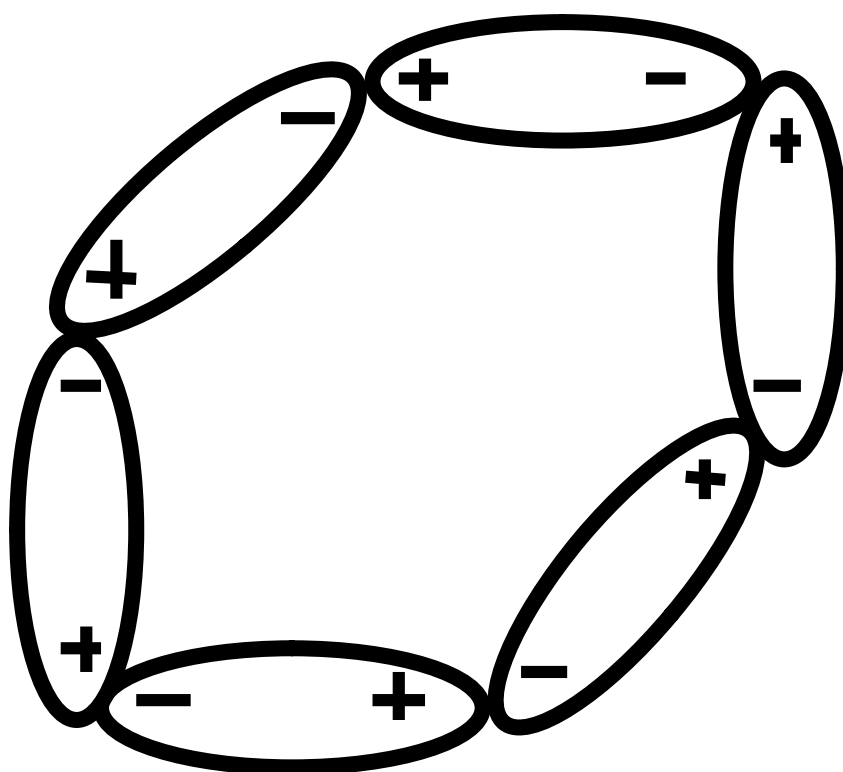
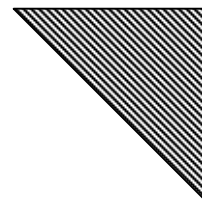


żelazo

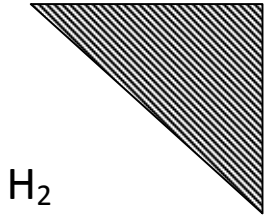


ołów

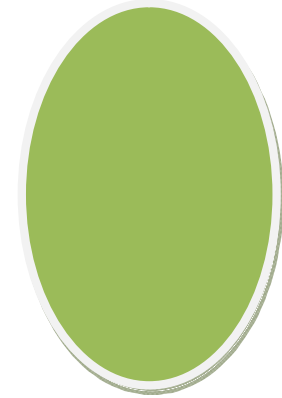
# Asocjacja cząsteczek wody



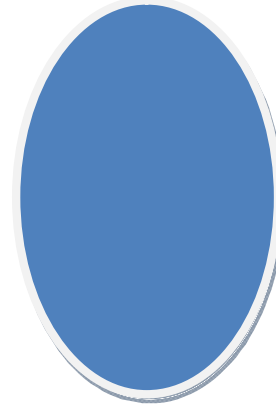
# Gęstość gazów



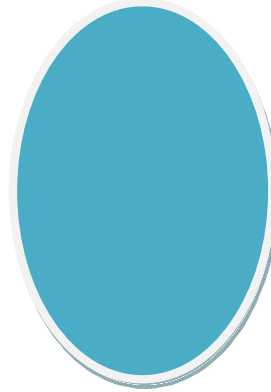
H<sub>2</sub>



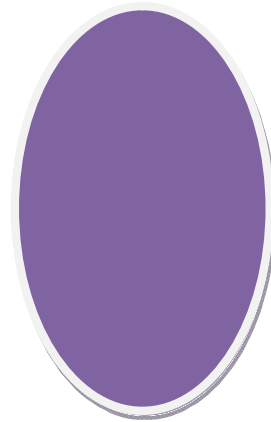
He



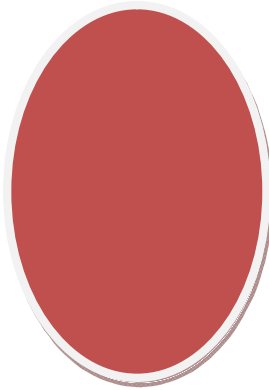
N<sub>2</sub>



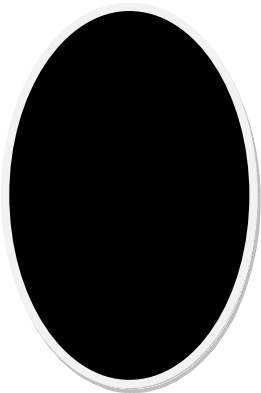
powietrze



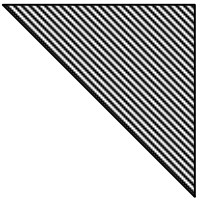
O<sub>2</sub>



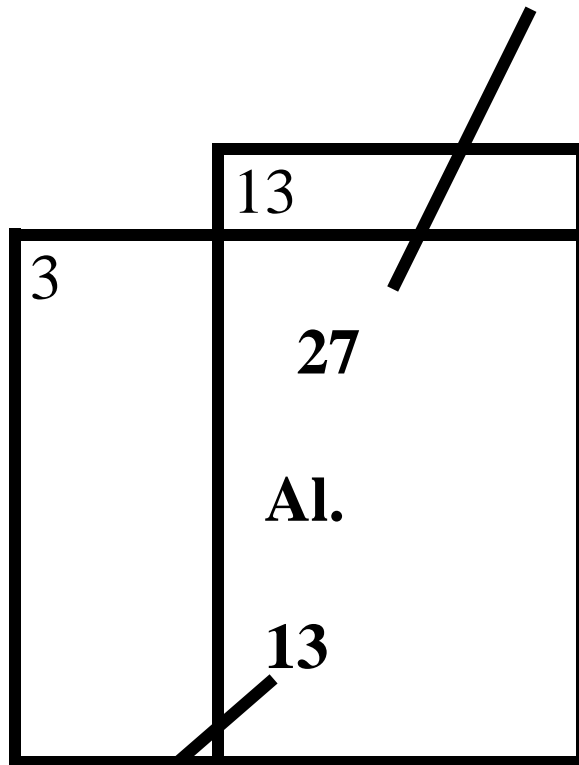
CO<sub>2</sub>



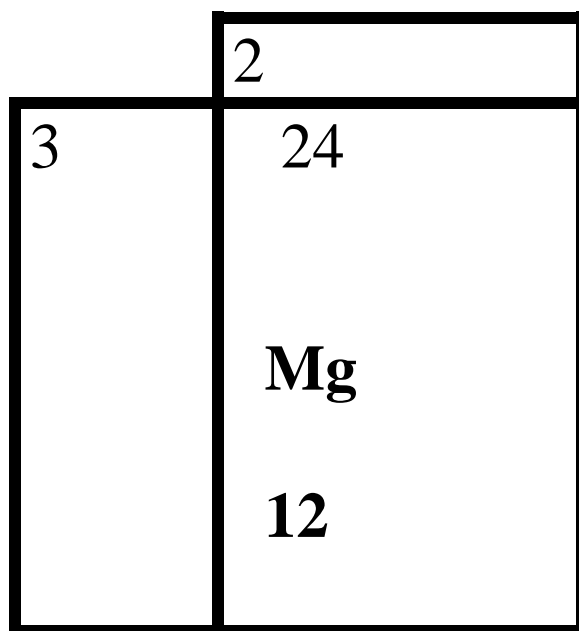


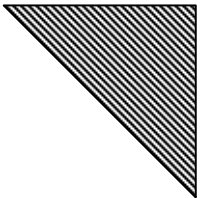


Liczba masowa

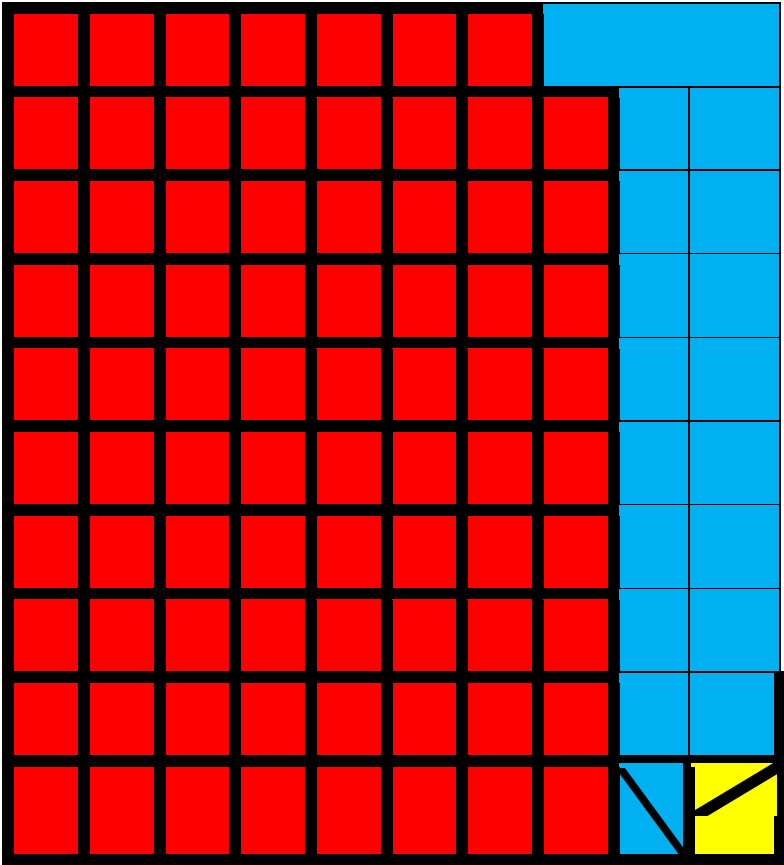


Liczba atomowa





# Skład procentowy powietrza



azot



tlen



inne gazy



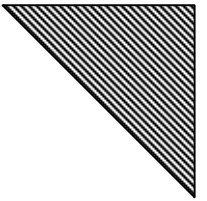
**substancja  
szkodliwa**



**substancja rca**



**substancja  
wybuchowa**



**substancja  
trujaca**



**substancja palna**

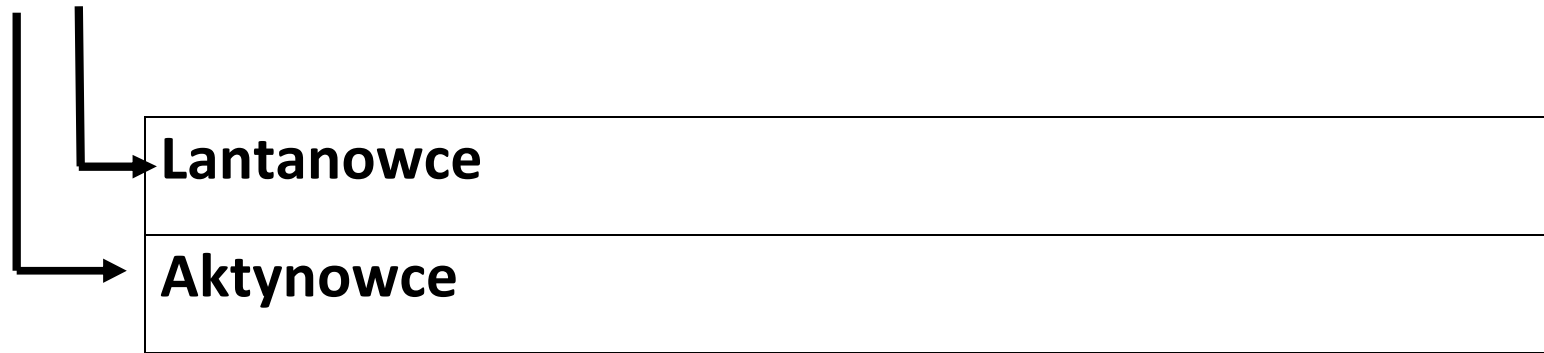


**substancja  
promieniotwórcza**

|          |                |                  |                  |                  |                  |                  |                   |                  |                   |                 |                   |                 |                |                 |                 |                 |                  |                |  |
|----------|----------------|------------------|------------------|------------------|------------------|------------------|-------------------|------------------|-------------------|-----------------|-------------------|-----------------|----------------|-----------------|-----------------|-----------------|------------------|----------------|--|
|          | <b>1</b>       |                  |                  |                  |                  |                  |                   |                  |                   |                 |                   |                 |                |                 |                 |                 |                  | <b>18</b>      |  |
| <b>1</b> | <b>Litowce</b> | <b>2</b>         |                  |                  |                  |                  |                   |                  |                   |                 |                   |                 |                |                 |                 |                 |                  |                |  |
| <b>2</b> |                |                  | <b>Berylowce</b> |                  |                  |                  |                   |                  |                   |                 |                   |                 |                |                 |                 |                 |                  |                |  |
| <b>3</b> |                | <b>3</b>         |                  | <b>4</b>         | <b>5</b>         | <b>6</b>         | <b>7</b>          | <b>8</b>         | <b>9</b>          | <b>10</b>       | <b>11</b>         | <b>12</b>       |                |                 |                 |                 |                  |                |  |
| <b>4</b> |                | <b>Skandowce</b> |                  | <b>Tytanowce</b> | <b>Wanadowce</b> | <b>Chromowce</b> | <b>Manganowce</b> | <b>Żelazowce</b> | <b>Kobaltowce</b> | <b>Niklowce</b> | <b>Miedziowce</b> | <b>Cynkowce</b> |                |                 |                 |                 |                  |                |  |
| <b>5</b> |                |                  |                  |                  |                  |                  |                   |                  |                   |                 |                   |                 |                |                 |                 |                 |                  |                |  |
| <b>6</b> |                |                  |                  |                  |                  |                  |                   |                  |                   |                 |                   |                 |                |                 |                 |                 |                  |                |  |
| <b>7</b> |                |                  |                  |                  |                  |                  |                   |                  |                   |                 |                   |                 |                |                 |                 |                 |                  |                |  |
|          |                |                  |                  |                  |                  |                  |                   |                  |                   |                 |                   |                 | <b>13</b>      | <b>14</b>       | <b>15</b>       | <b>16</b>       | <b>17</b>        |                |  |
|          |                |                  |                  |                  |                  |                  |                   |                  |                   |                 |                   |                 | <b>Borowce</b> | <b>Węglowce</b> | <b>Azotowce</b> | <b>Tlenowce</b> | <b>Fluorowce</b> | <b>Helowce</b> |  |



|          |          |          |          |          |          |          |          |          |          |           |           |           |           |           |           |           |           |  |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|
|          | <b>1</b> |          |          |          |          |          |          |          |          |           |           |           |           |           |           |           | <b>18</b> |  |
| <b>1</b> |          | <b>2</b> |          |          |          |          |          |          |          |           |           |           | <b>13</b> | <b>14</b> | <b>15</b> | <b>16</b> | <b>17</b> |  |
| <b>2</b> |          |          |          |          |          |          |          |          |          |           |           |           |           |           |           |           |           |  |
| <b>3</b> |          |          | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> | <b>7</b> | <b>8</b> | <b>9</b> | <b>10</b> | <b>11</b> | <b>12</b> |           |           |           |           |           |  |
| <b>4</b> |          |          |          |          |          |          |          |          |          |           |           |           |           |           |           |           |           |  |
| <b>5</b> |          |          |          |          |          |          |          |          |          |           |           |           |           |           |           |           |           |  |
| <b>6</b> |          |          |          |          |          |          |          |          |          |           |           |           |           |           |           |           |           |  |
| <b>7</b> |          |          |          |          |          |          |          |          |          |           |           |           |           |           |           |           |           |  |



# Pierwiastki grup głównych od pierwszego do czwartego okresu

|   |    |    |    |    |    |    |    |    |
|---|----|----|----|----|----|----|----|----|
|   | 1  |    |    |    |    |    |    | 18 |
| 1 | H  | 2  | 13 | 14 | 15 | 16 | 17 | He |
| 2 | Li | Be | B  | C  | N  | O  | F  | Ne |
| 3 | Na | Mg | Al | Si | P  | S  | Cl | Ar |
| 4 | K  | Ca |    |    |    |    | Br |    |



**Substancja szkodliwa**



**substancja  
trująca**



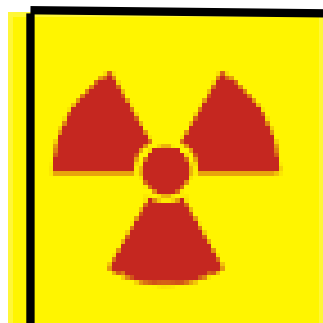
**Substancja żrąca**



**substancja palna**

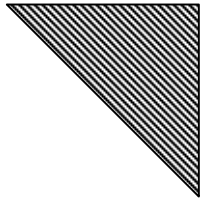


**Substancja  
wybuchowa**



**substancja  
promieniotwórcza**





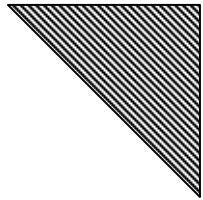
# Termometr lekarski



Fizyka





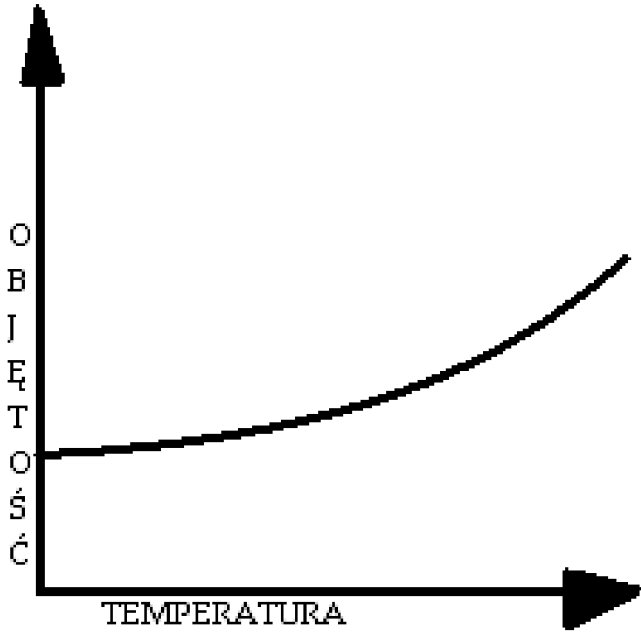


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•••••••• ••••••••

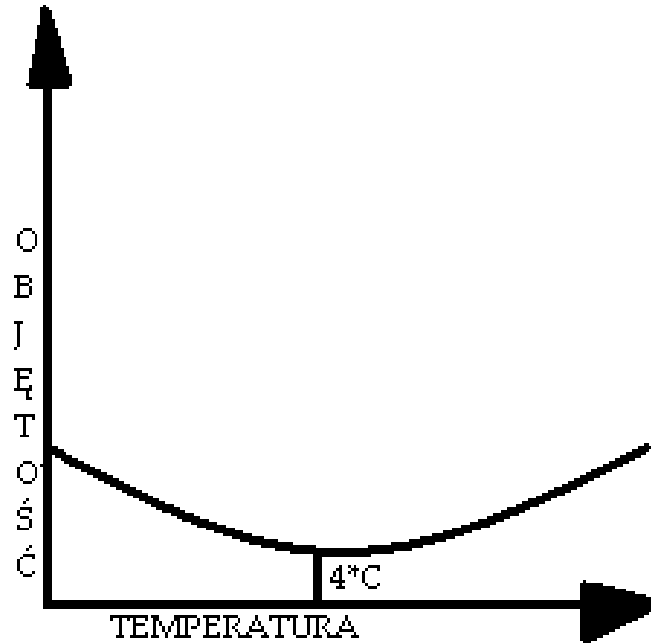
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•• •• •••• •••• •••• •••• ••••



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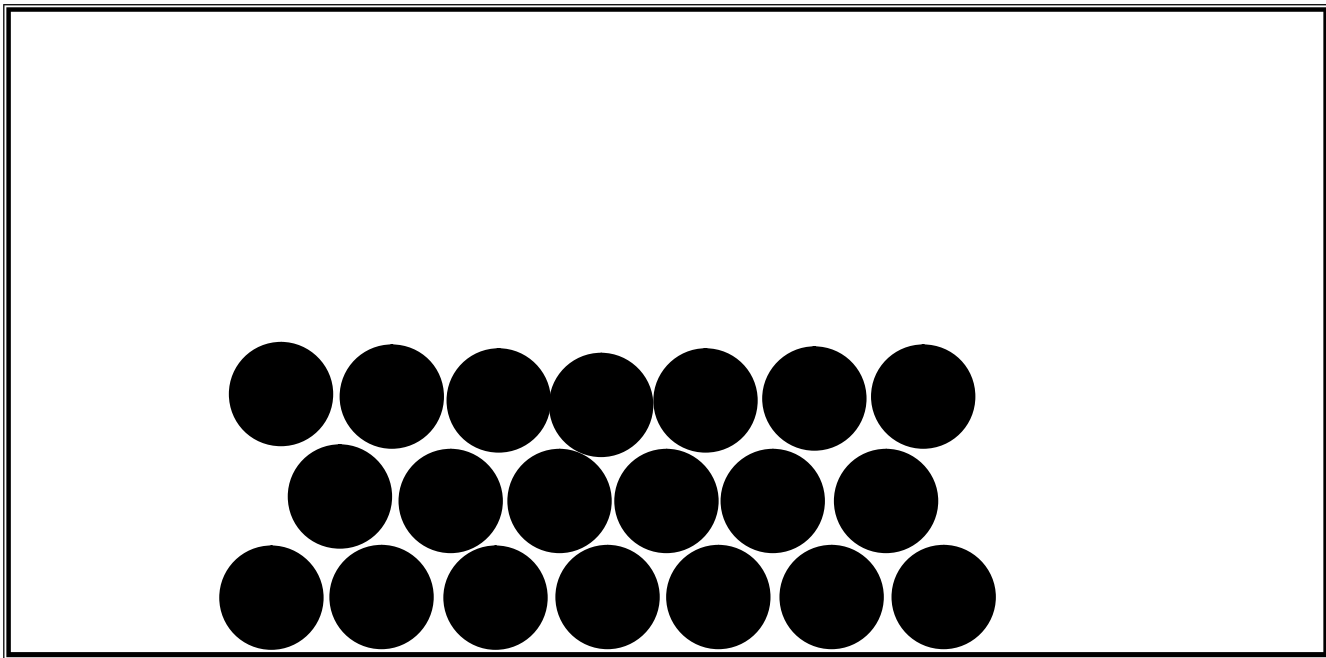
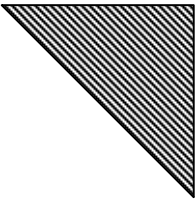


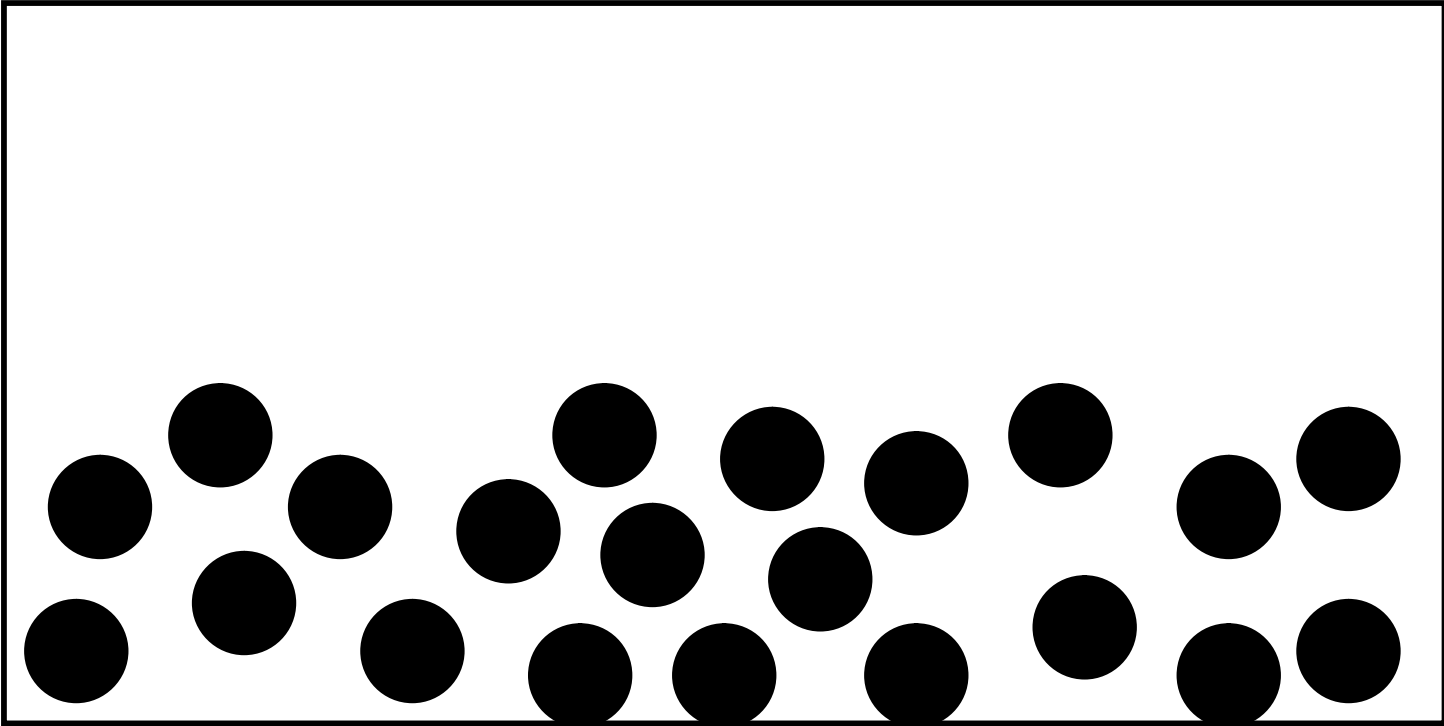
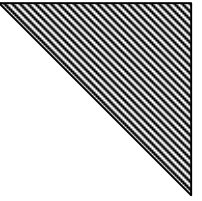


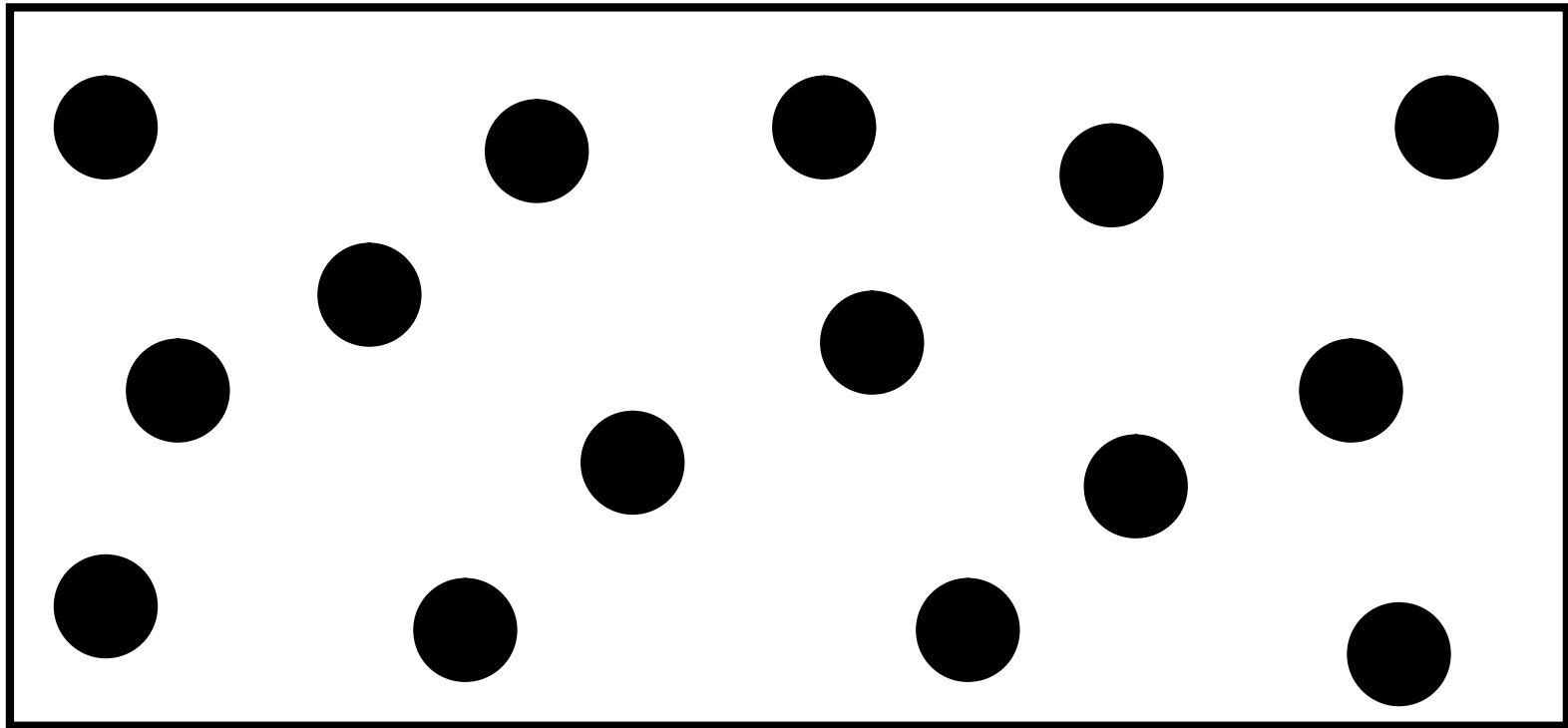
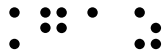
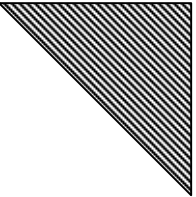




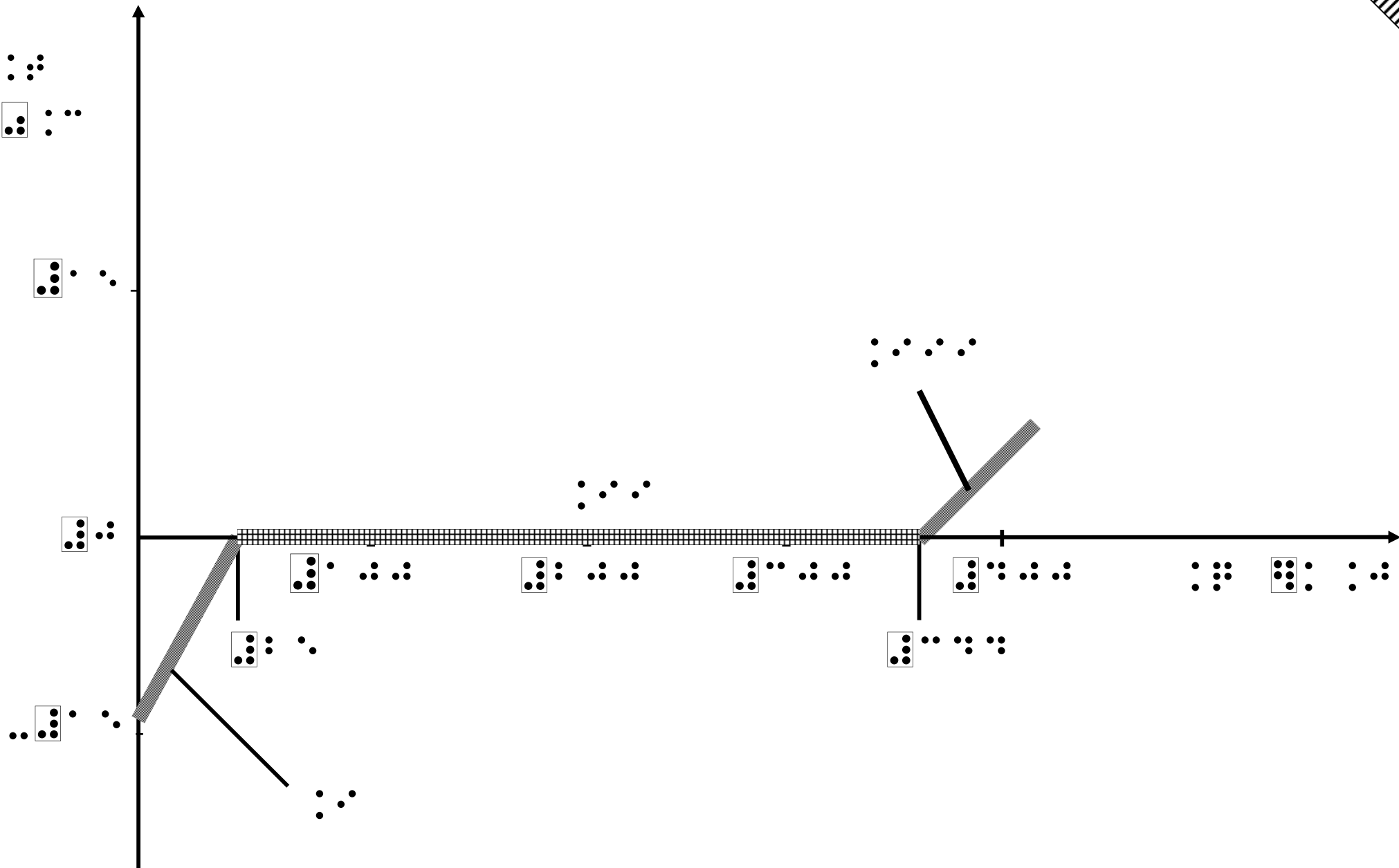
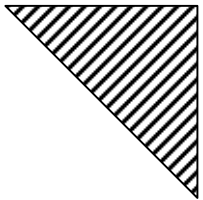




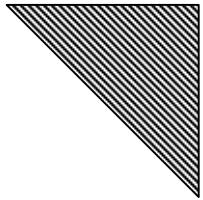




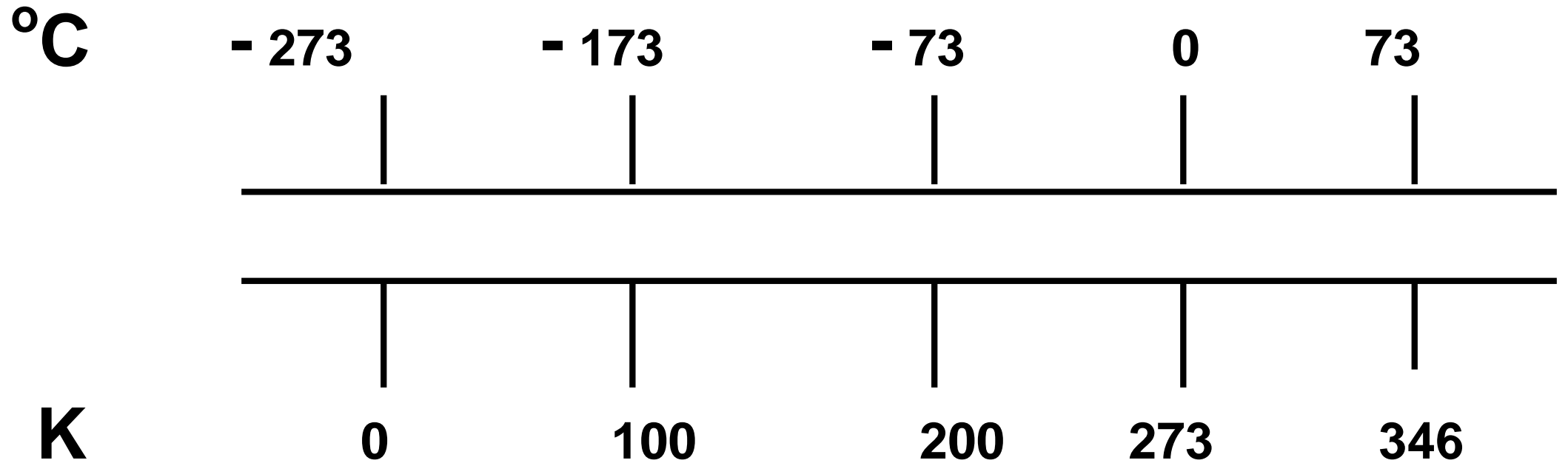


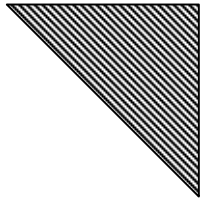




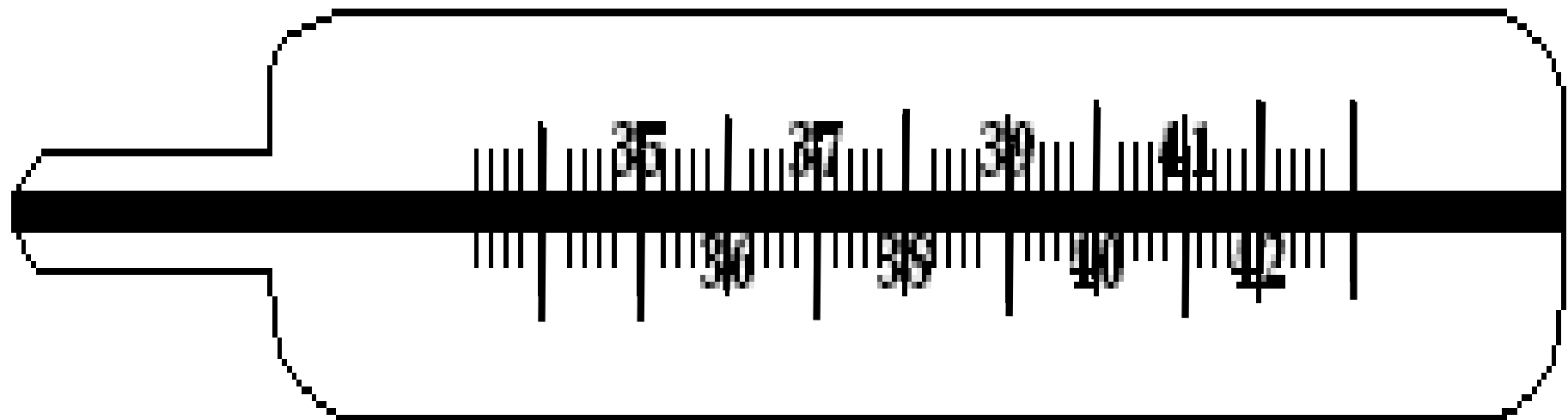


# Skale temperatur

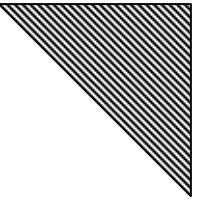




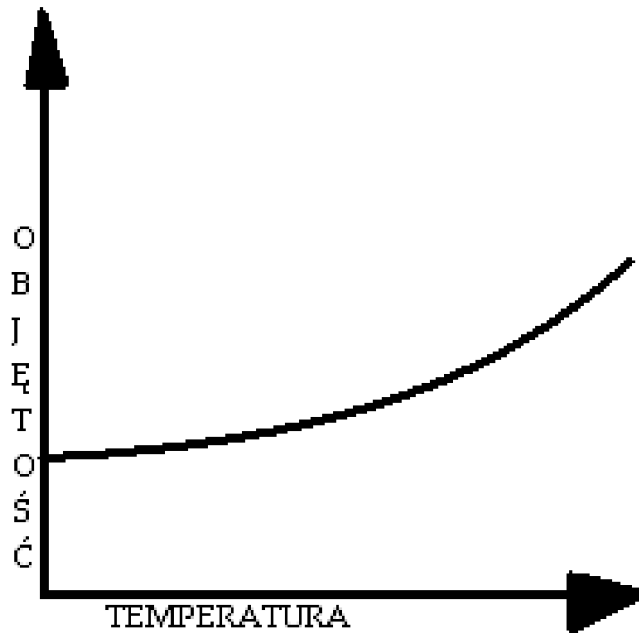
# Termometr lekarski



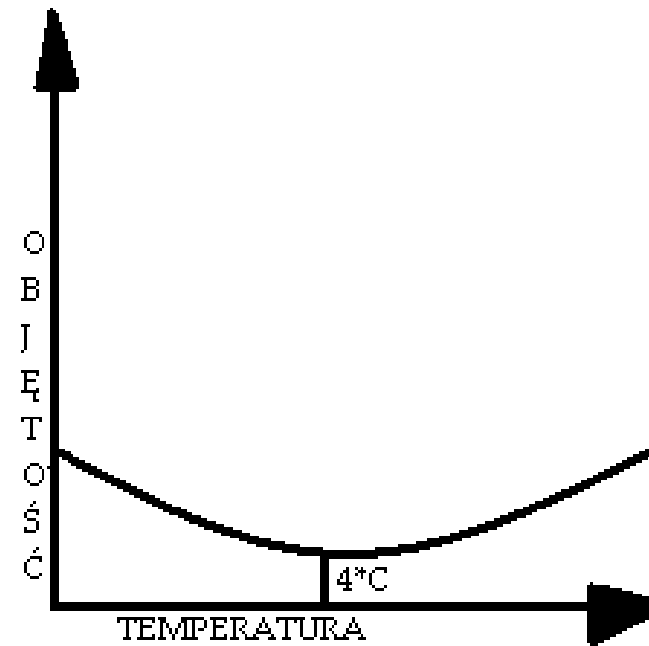
# Anomalia rozszerzalności cieplnej wody



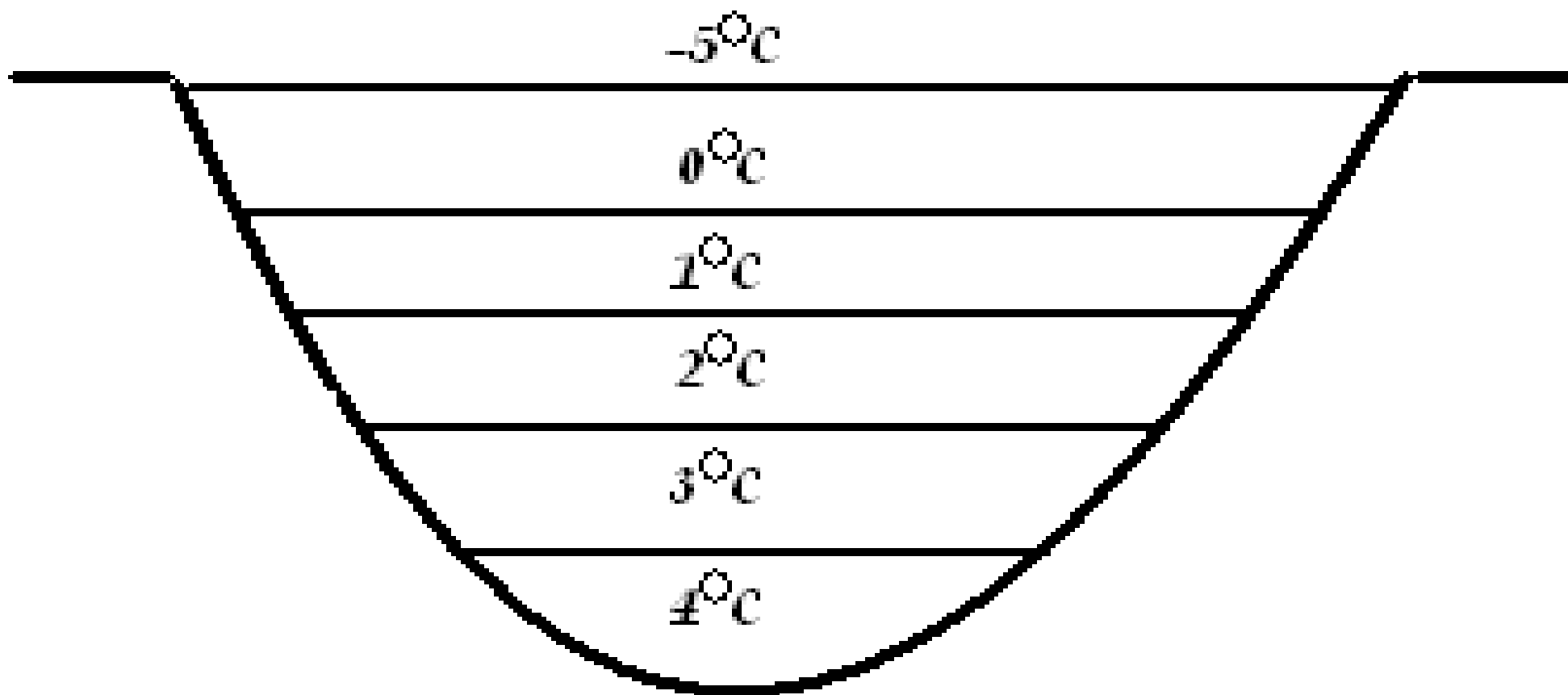
typowa ciecz

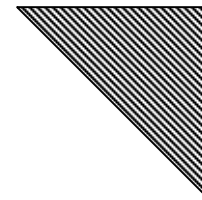


woda



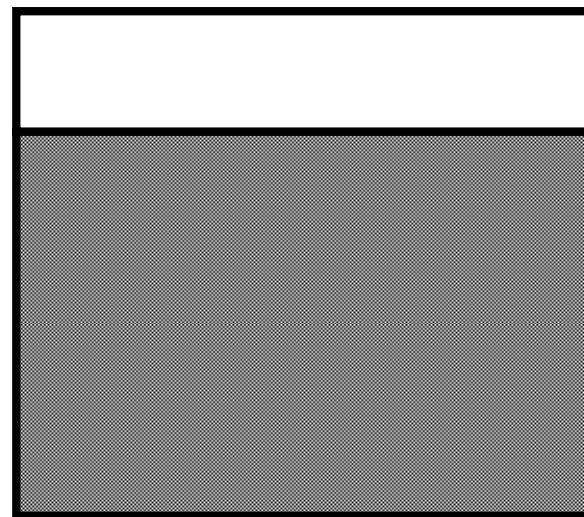
# Znaczenie anomalnej rozszerzalności wody w przyrodzie



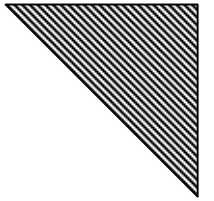


# Zjawisko rozszerzalności zamrożonej wody

**Woda w stanie  
ciekłym w temperaturze  
pokojowej**



# Zjawisko rozszerzalności zamrożonej wody

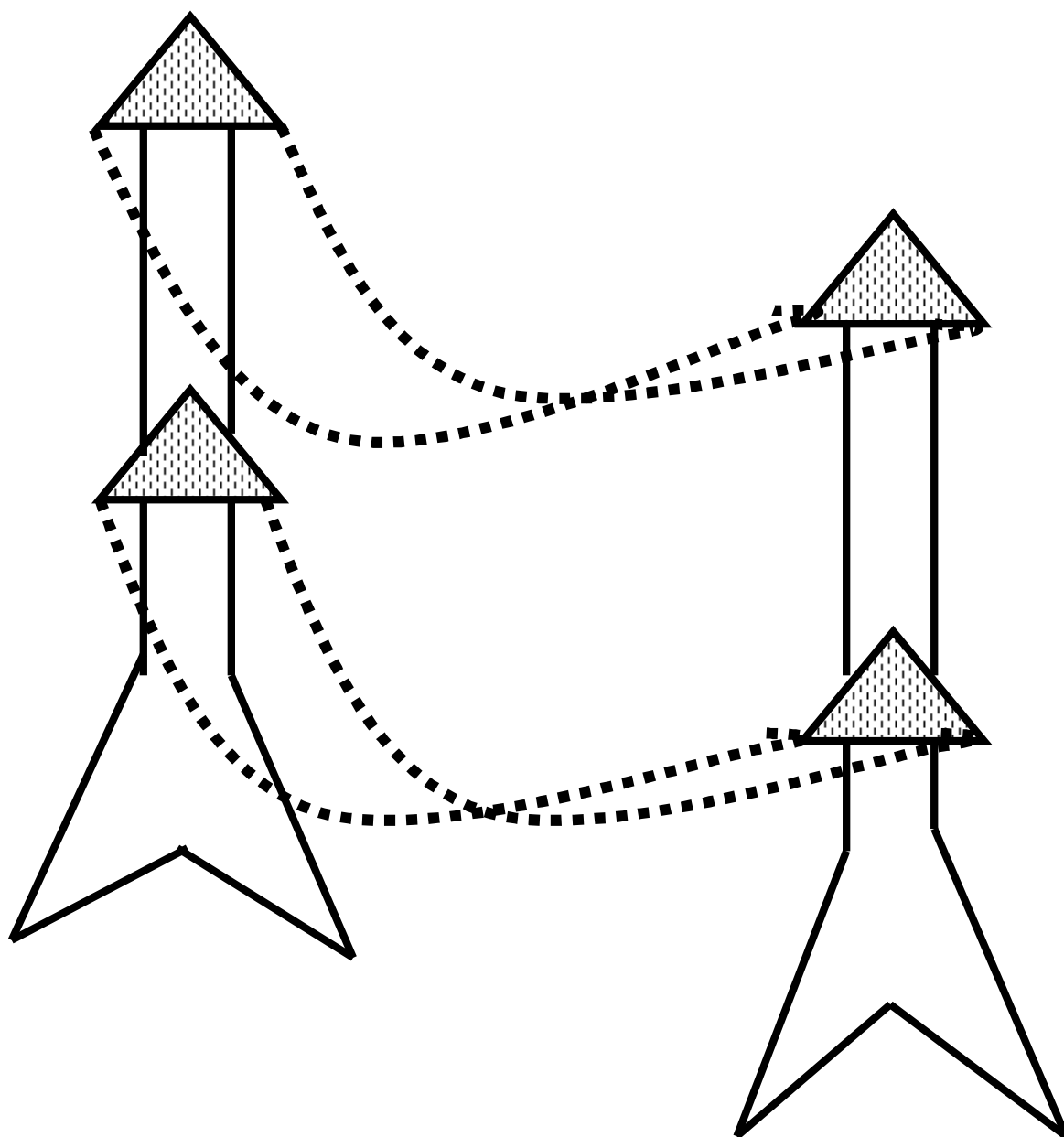
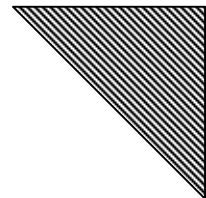


**Woda w trakcie  
zamarzania,**

**w temperaturze  
poniżej 0° C**

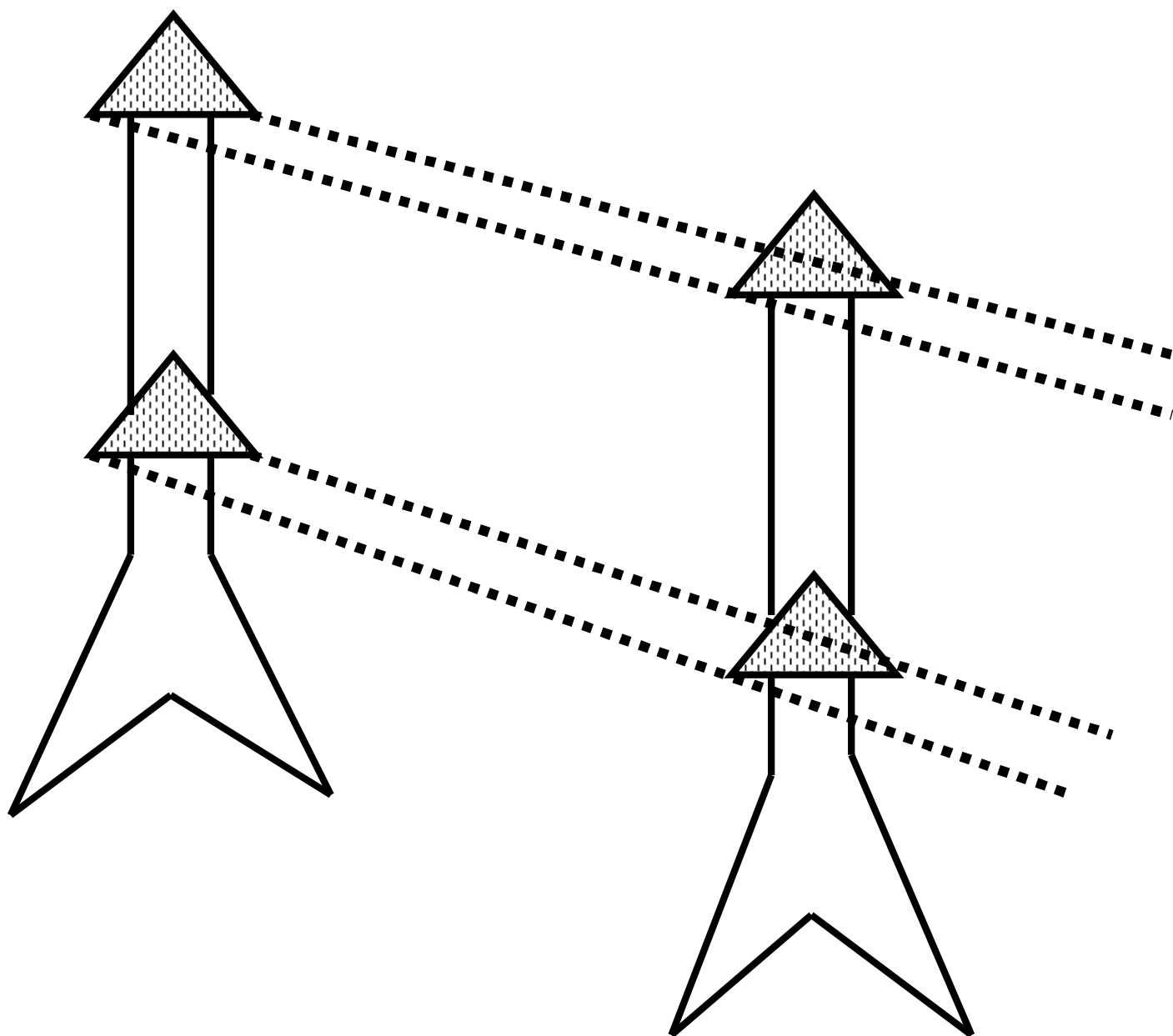
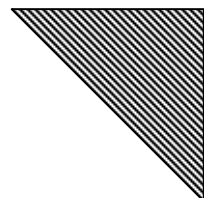


# Linie energetyczne podczas lata wiszą luźno.



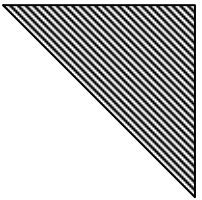
# Linie energetyczne

podczas zimy są naprężone



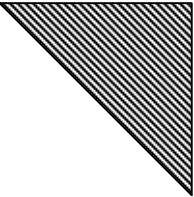


# Bimetal

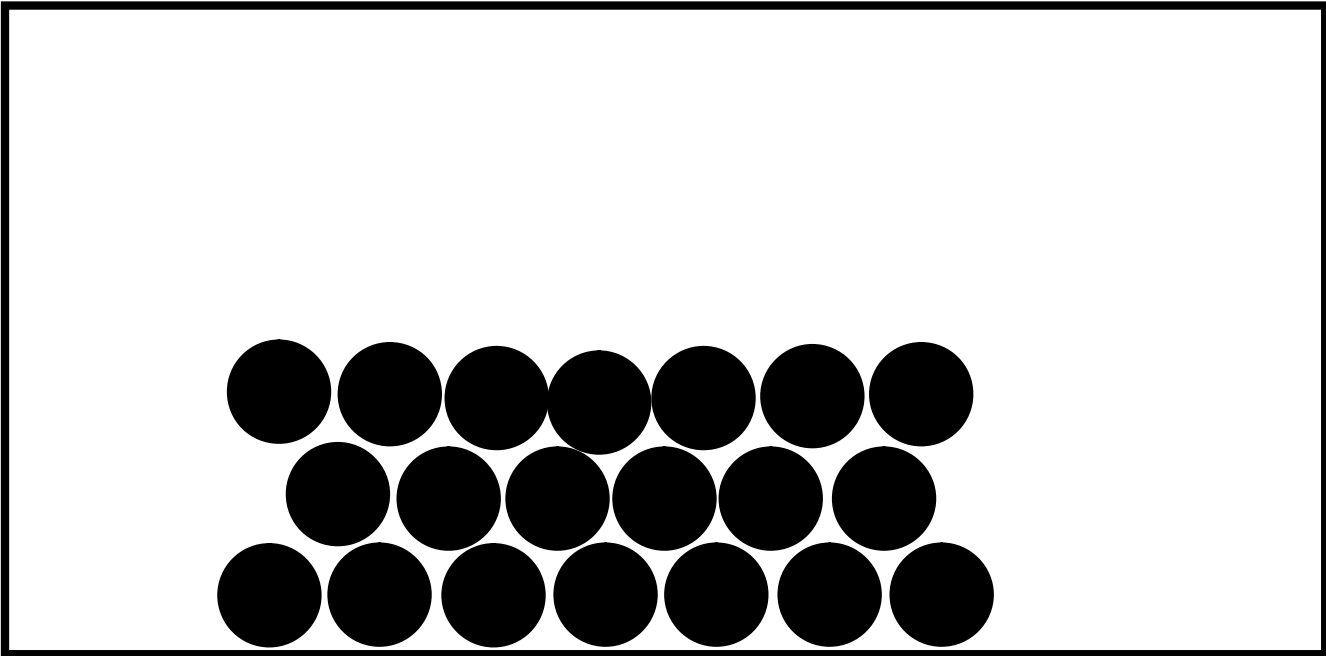


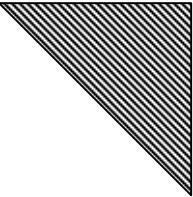
← **metal o mniejszej rozszerzalności**

← **metal o większej rozszerzalności**

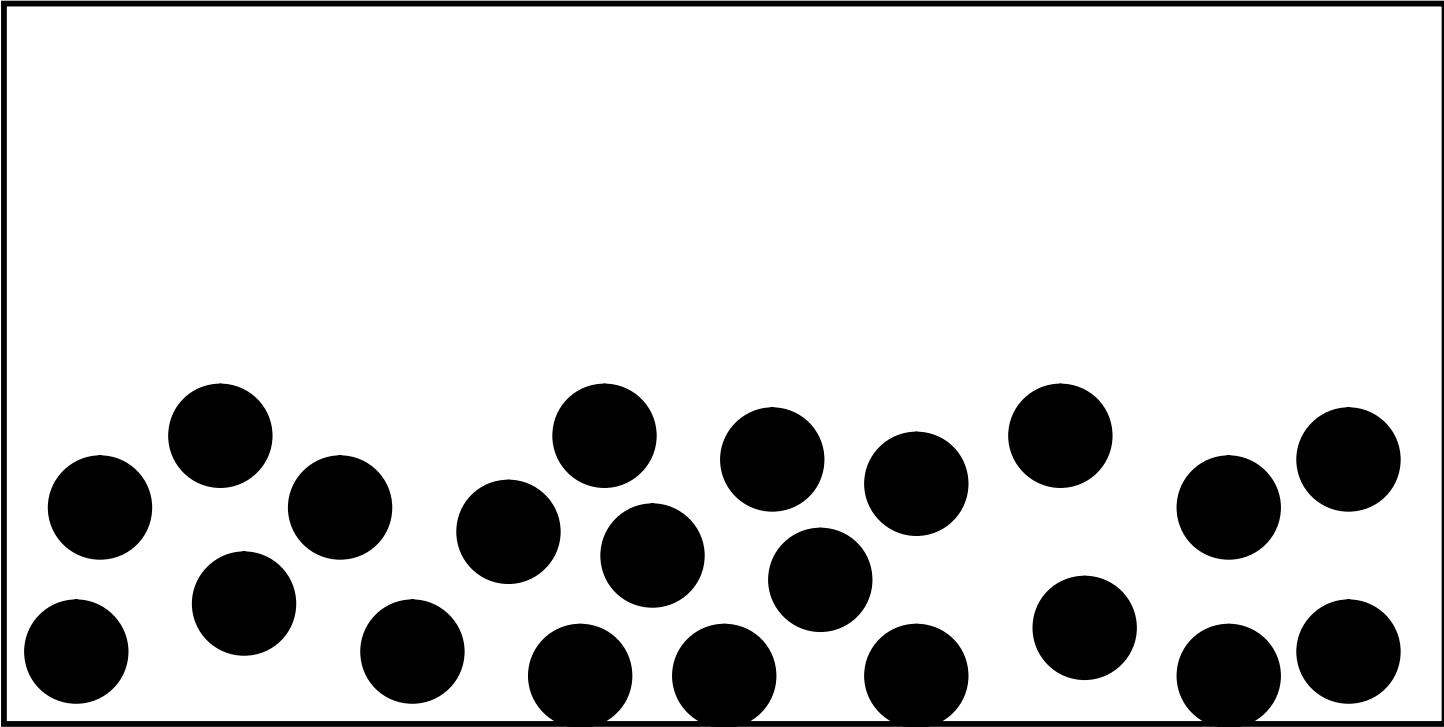


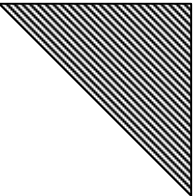
# CIAŁO STAŁE



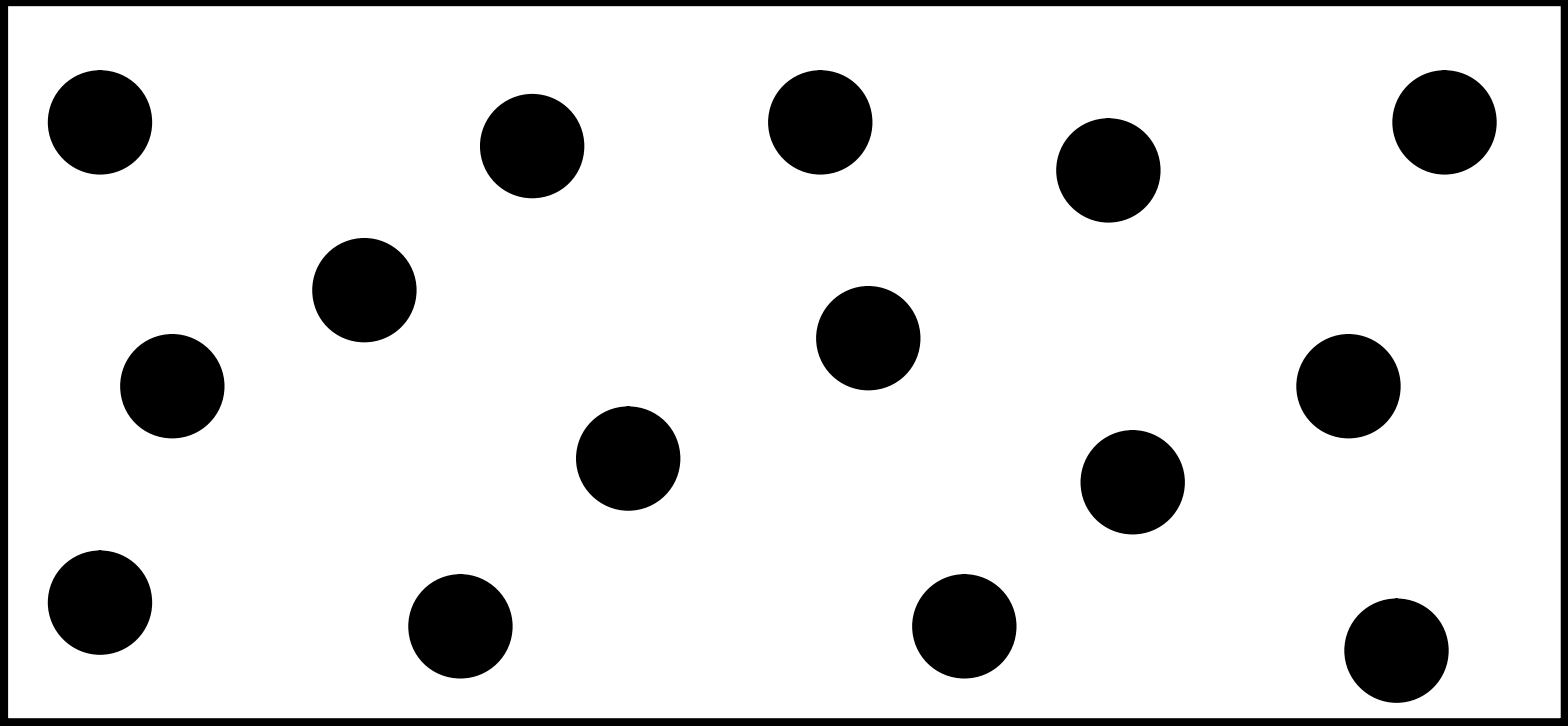


# CIECZ

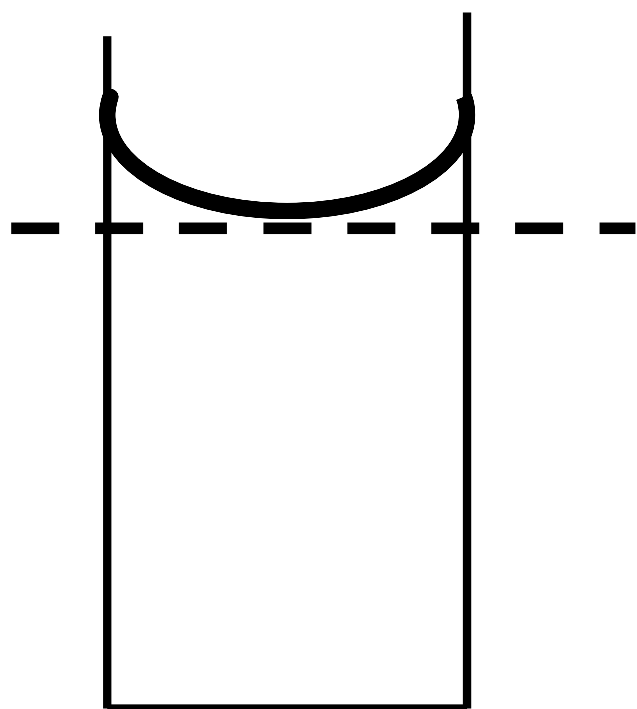




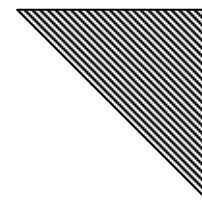
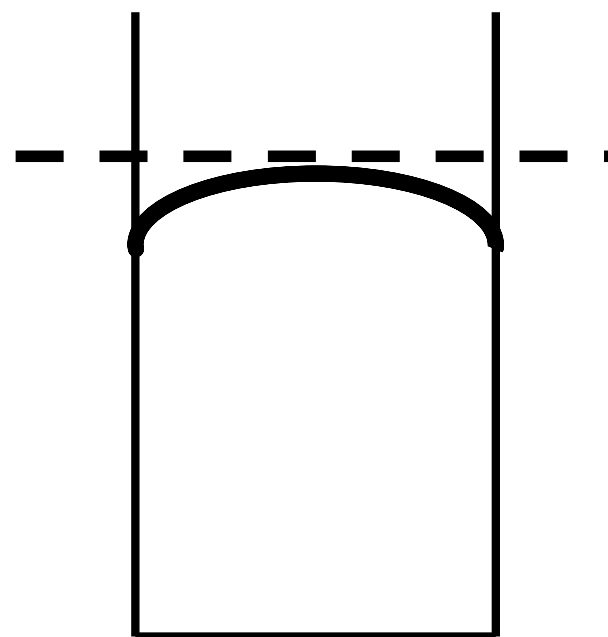
**GAZ**

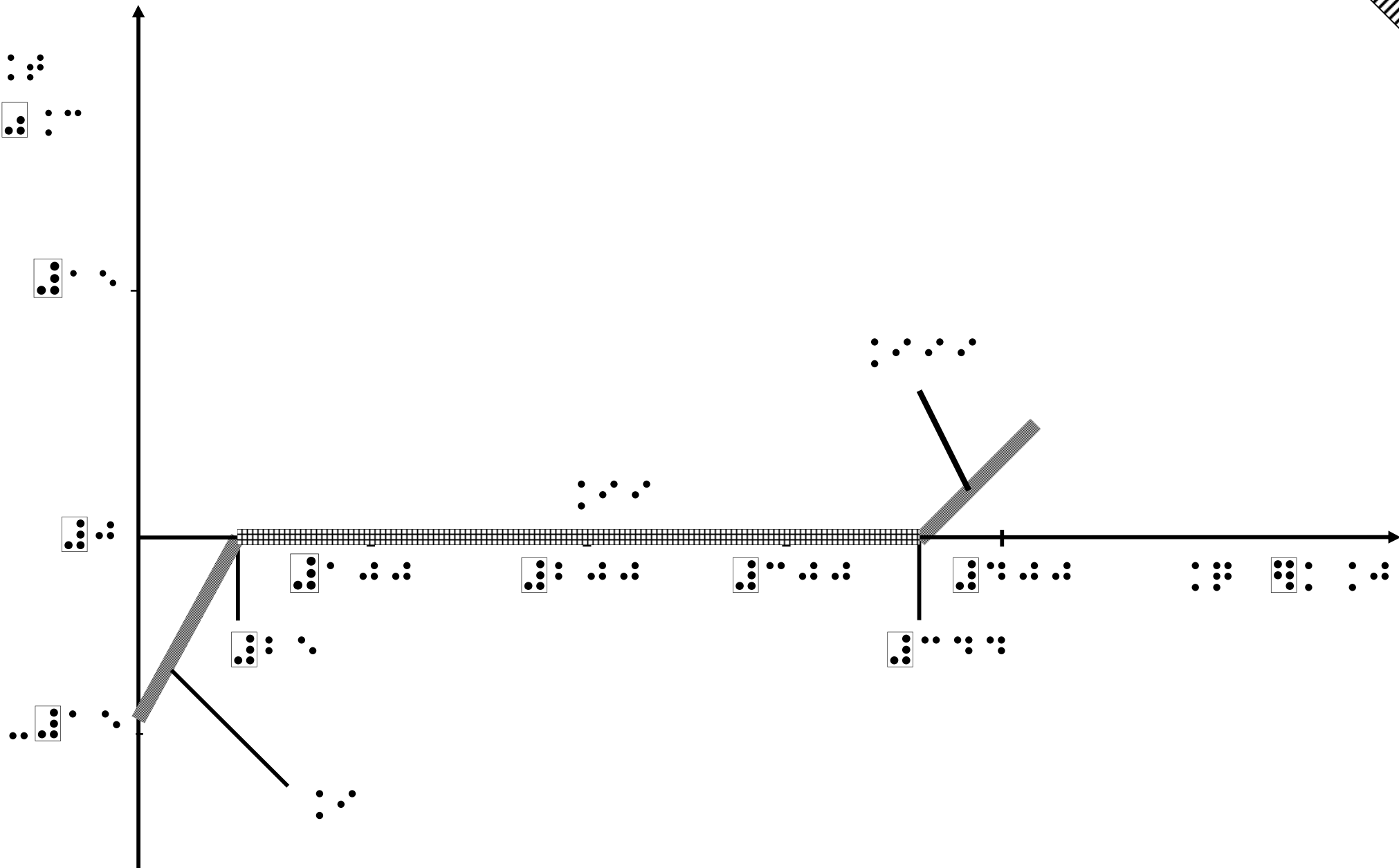
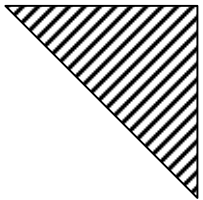


menisk  
wklęsły

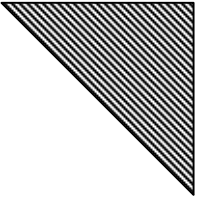


menisk  
wypukły

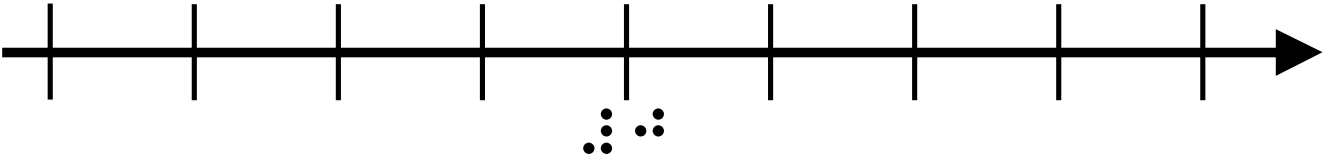




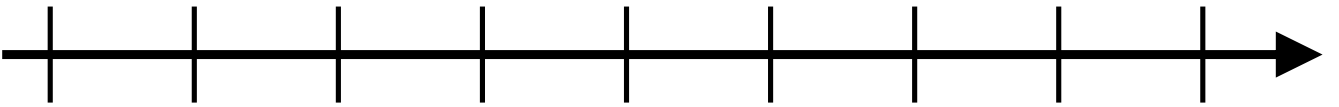
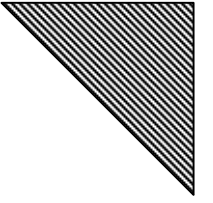
Matematyka



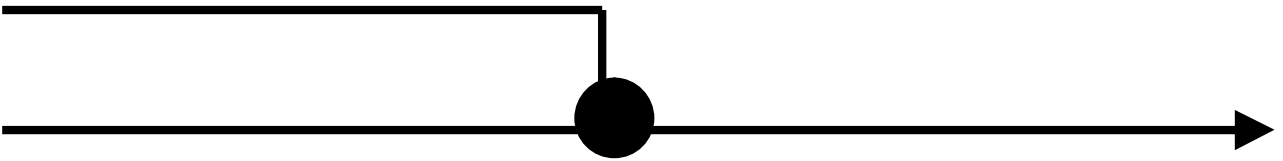
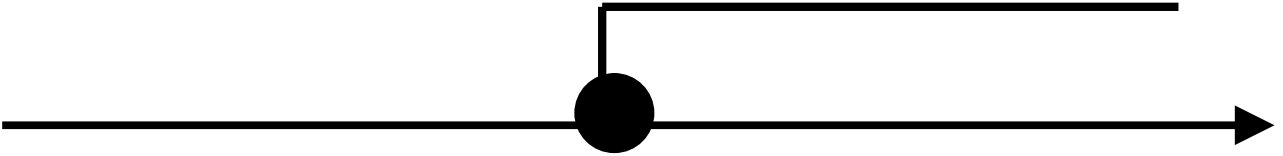
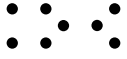
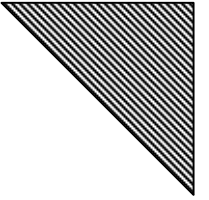
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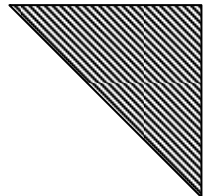




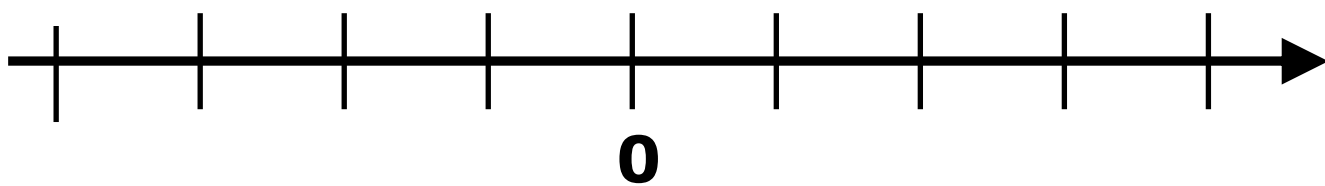






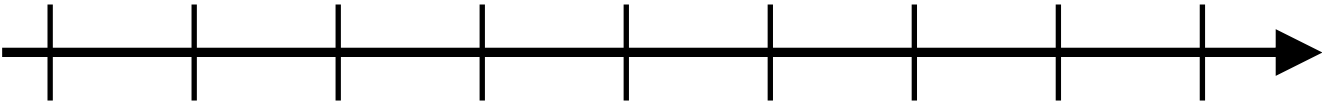
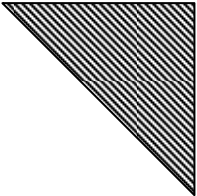


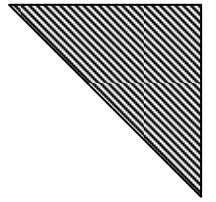
# Oś liczbowa



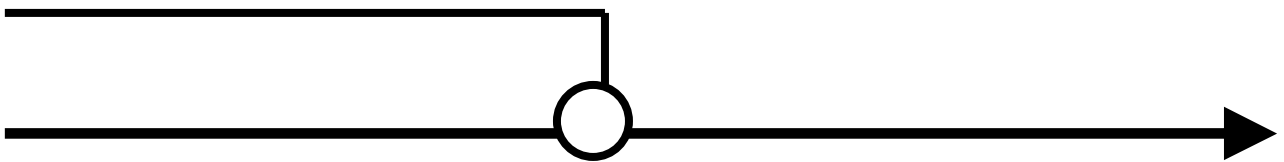
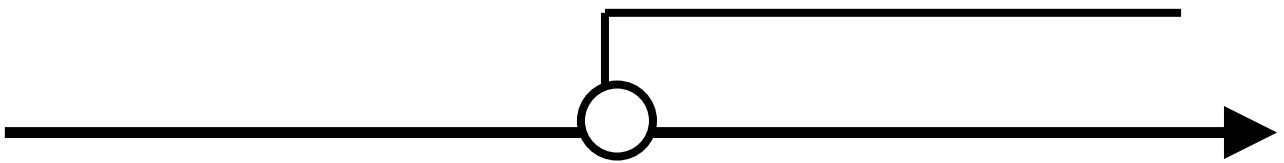


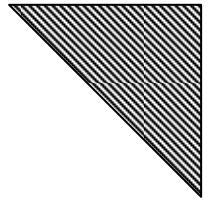
# Osie



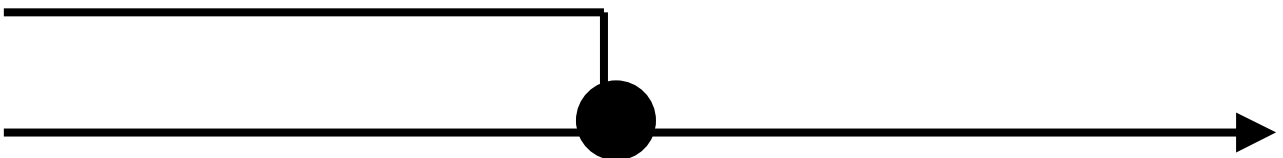
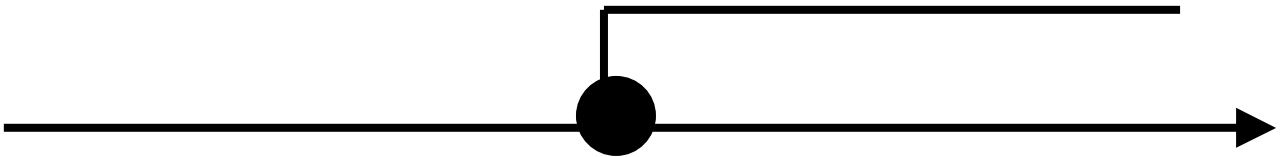


# Oś - przedział otwarty

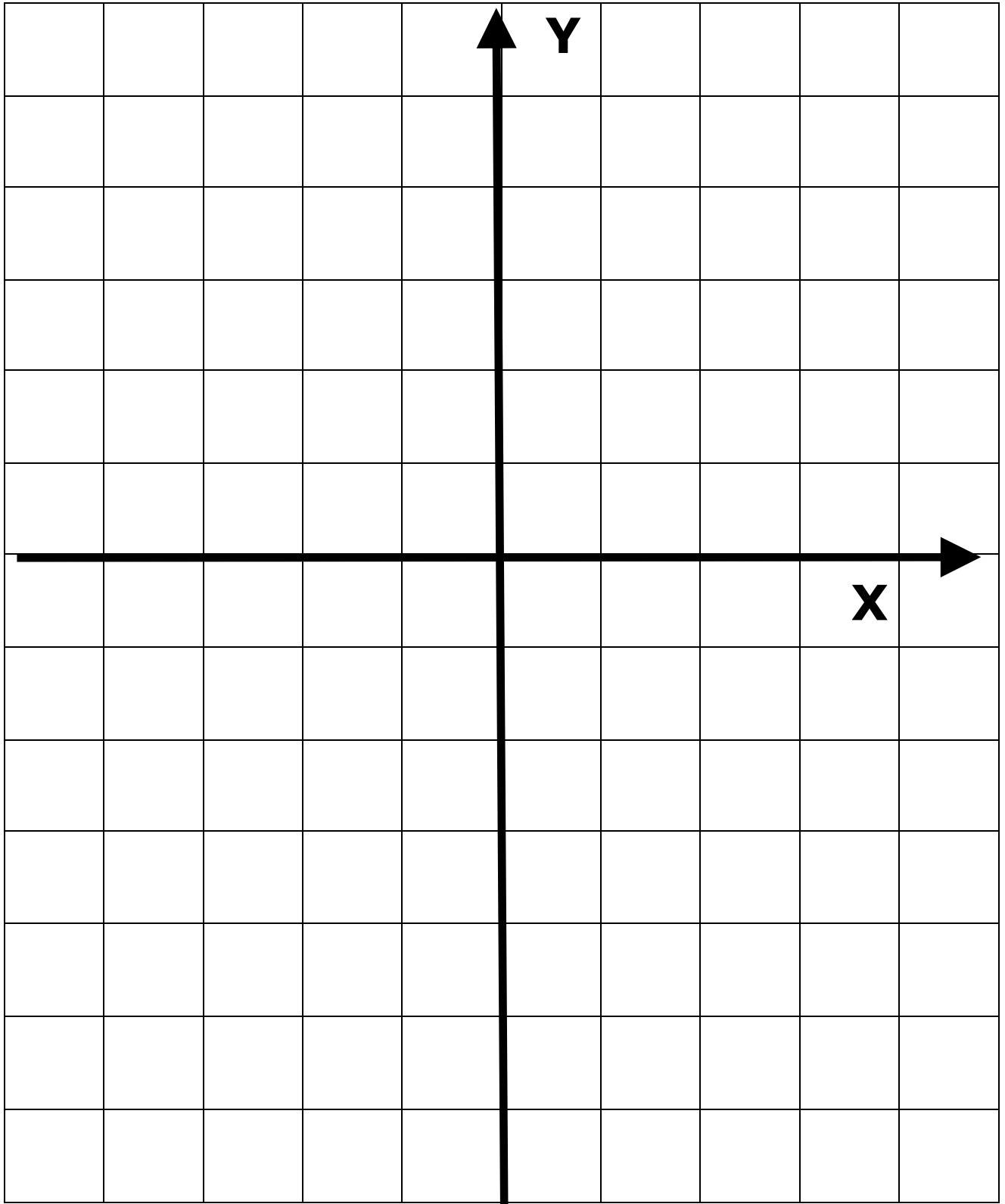
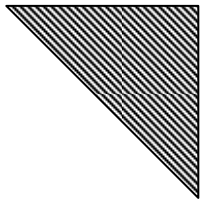




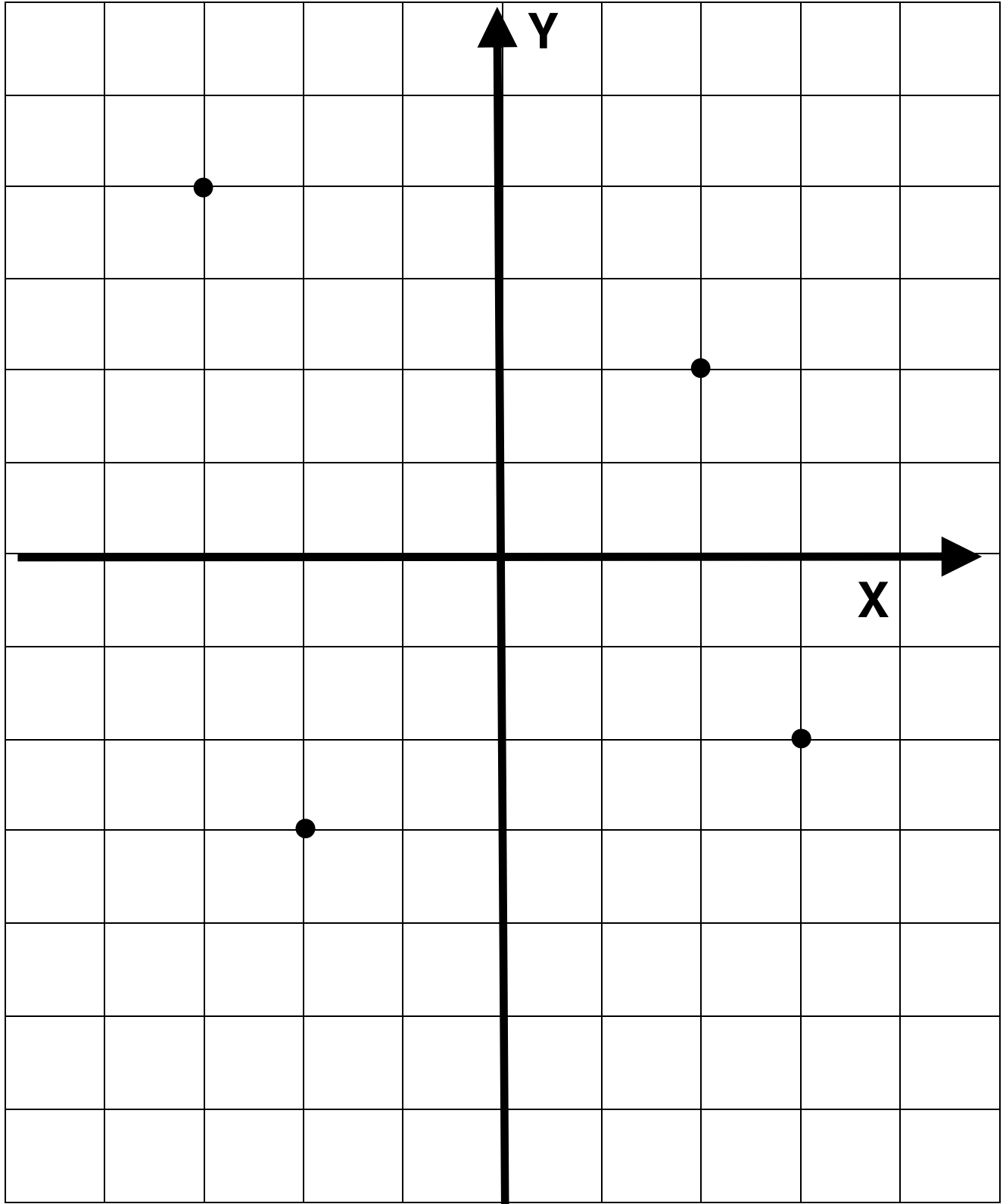
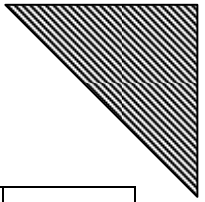
# Oś - przedział domknięty



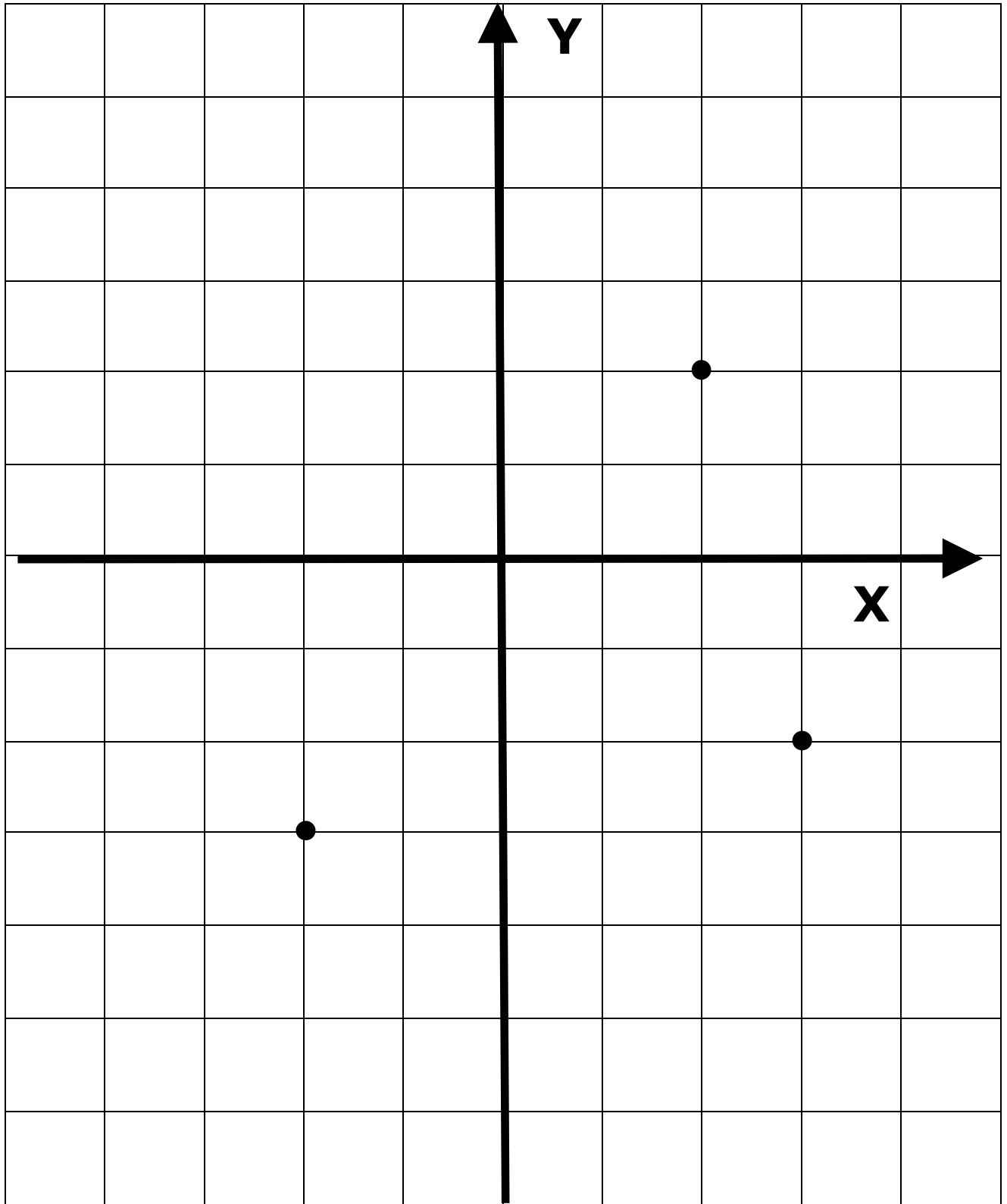
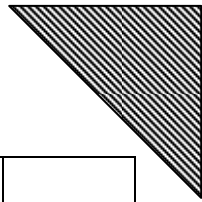
# Układ współrzędnych



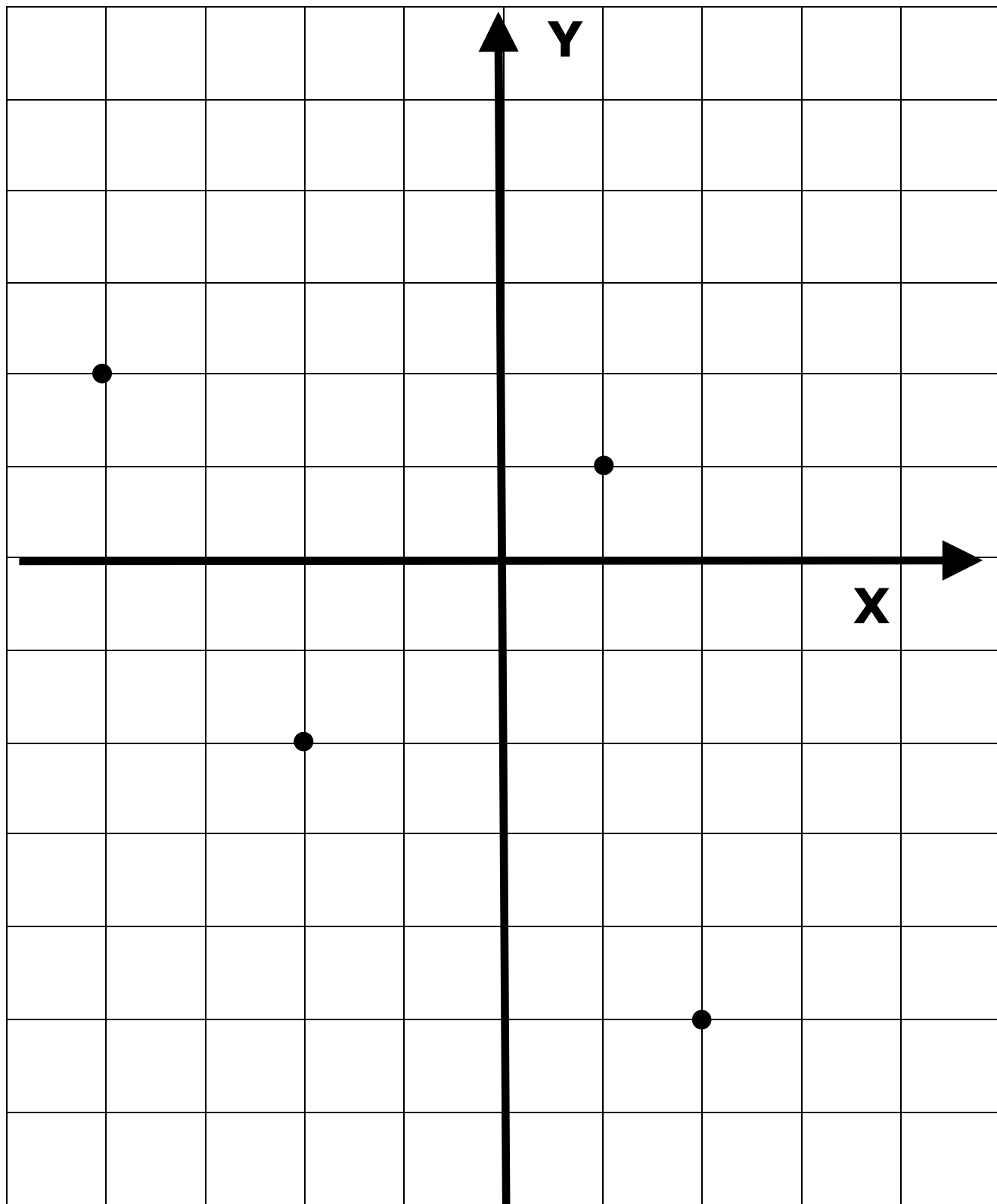
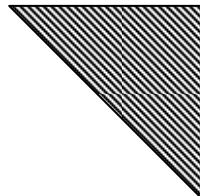
# Układ współrzędnych - punkty



# Układ współrzędnych - punkty



# Układ współrzędnych- punkty



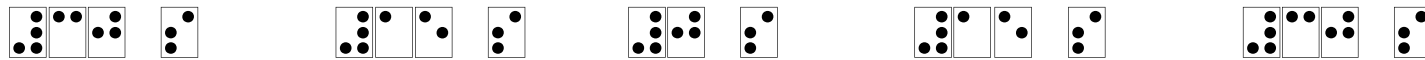
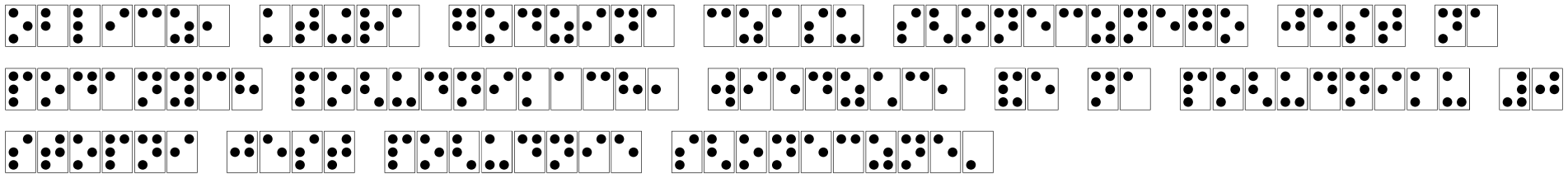
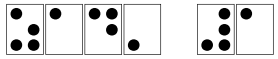
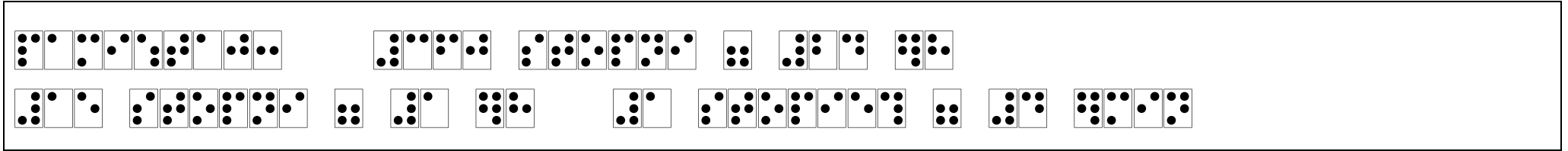
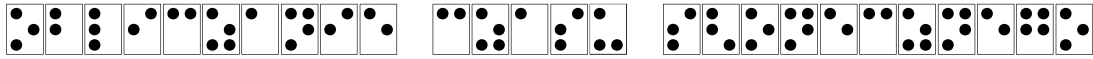
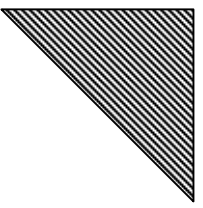
# Geografia





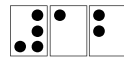






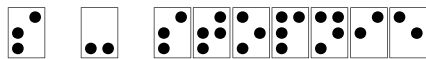
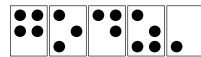
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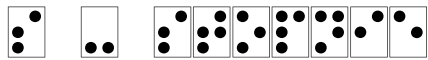
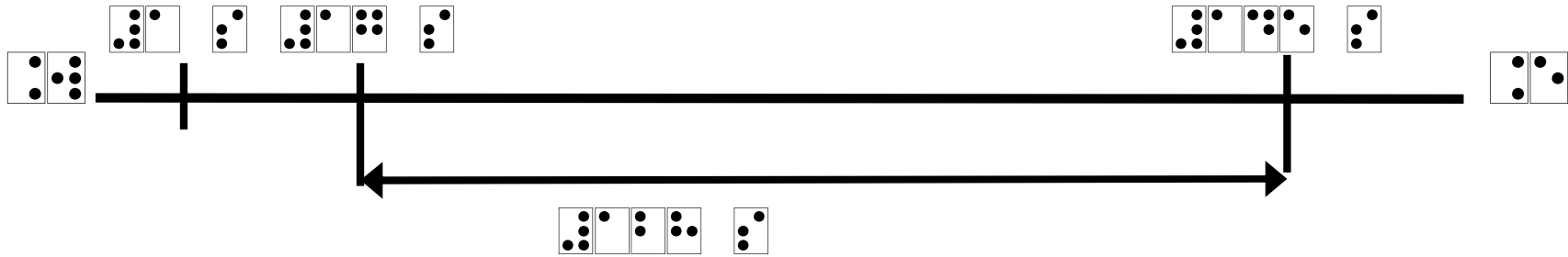
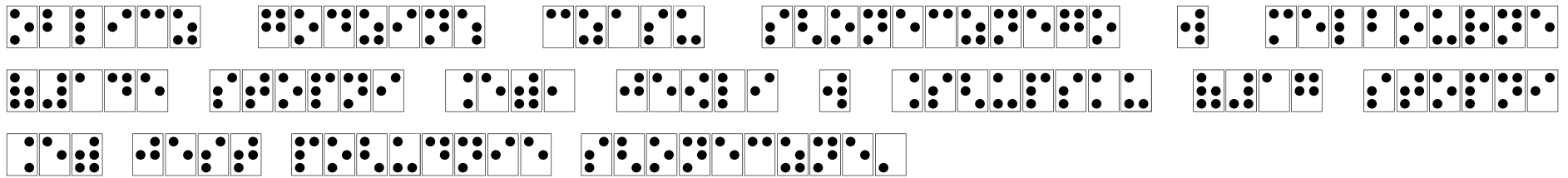
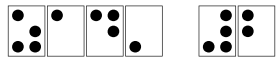
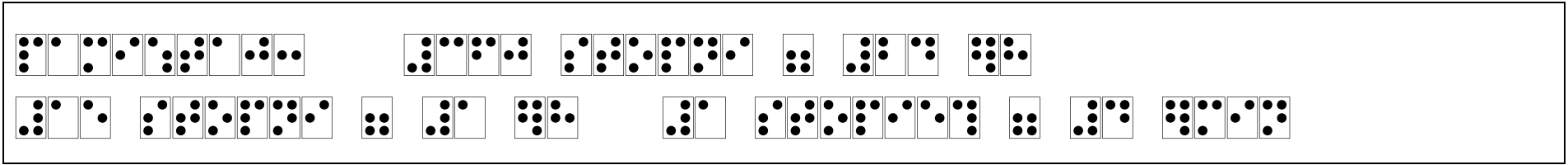
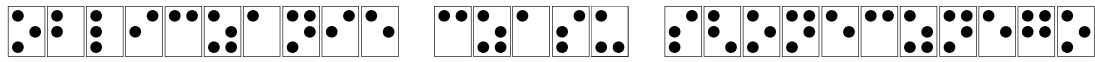
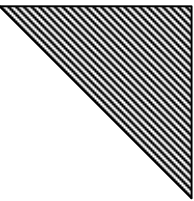
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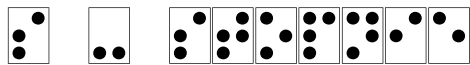
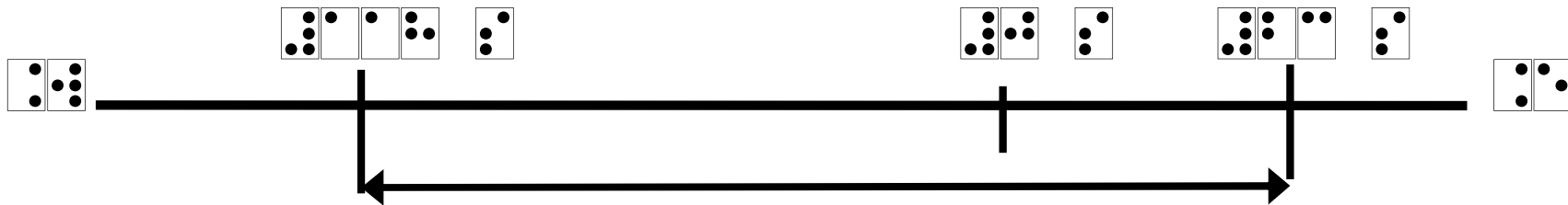
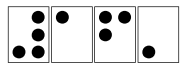
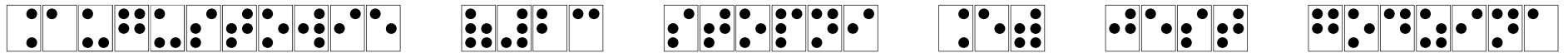
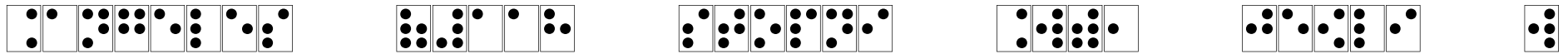
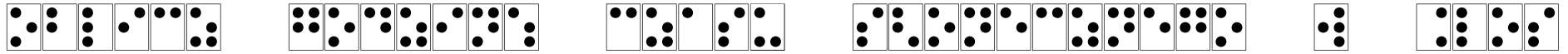
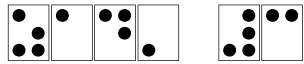
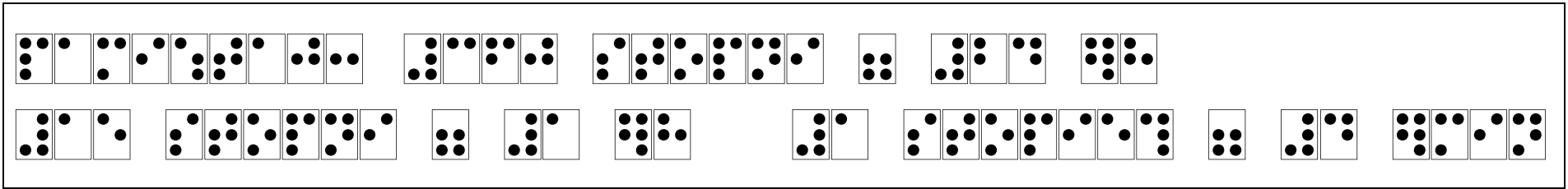
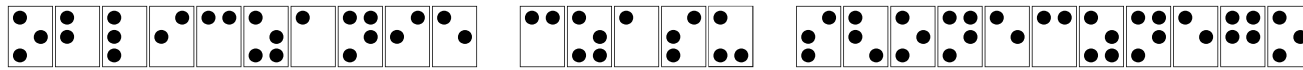
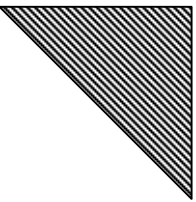


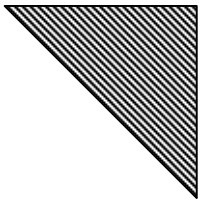
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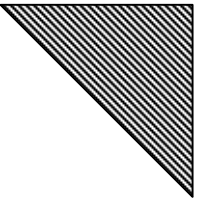




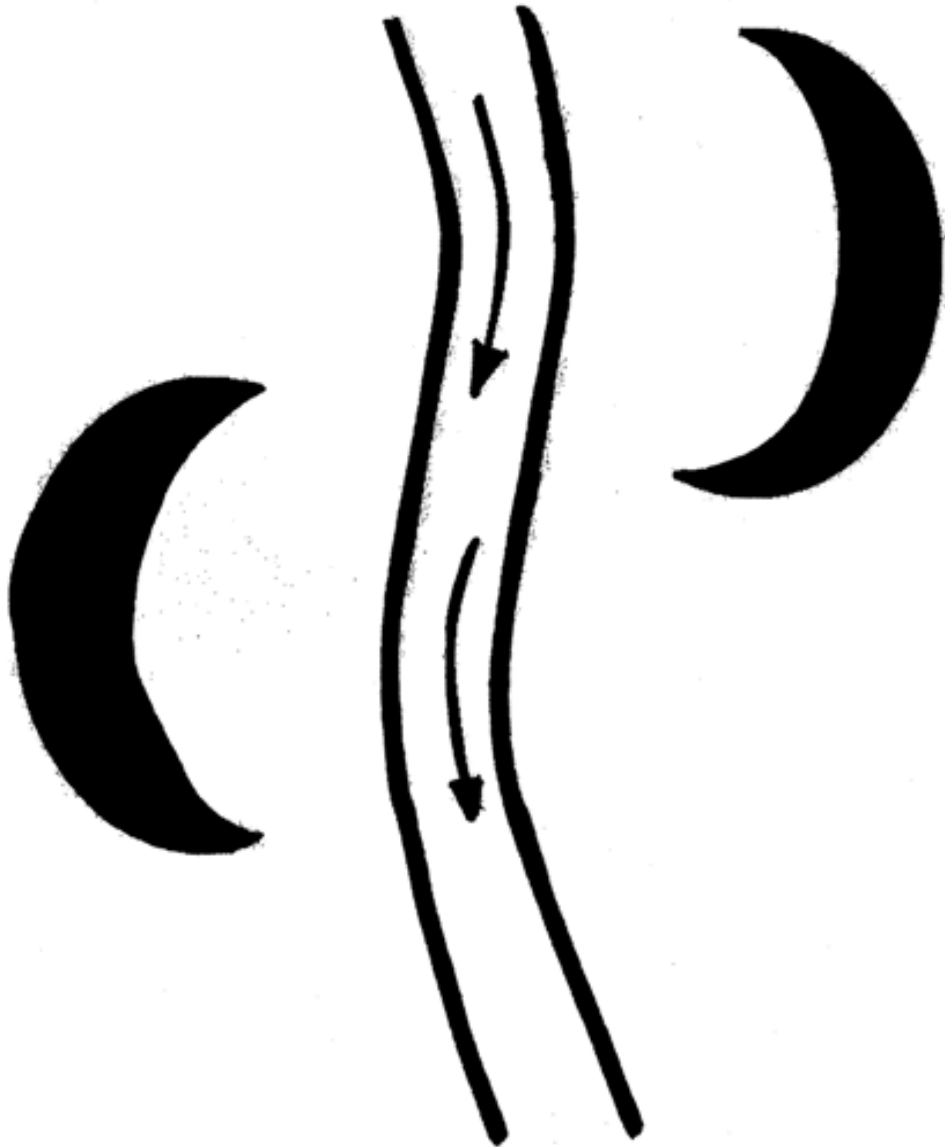


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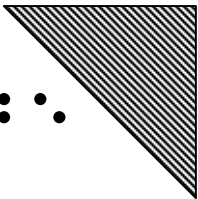




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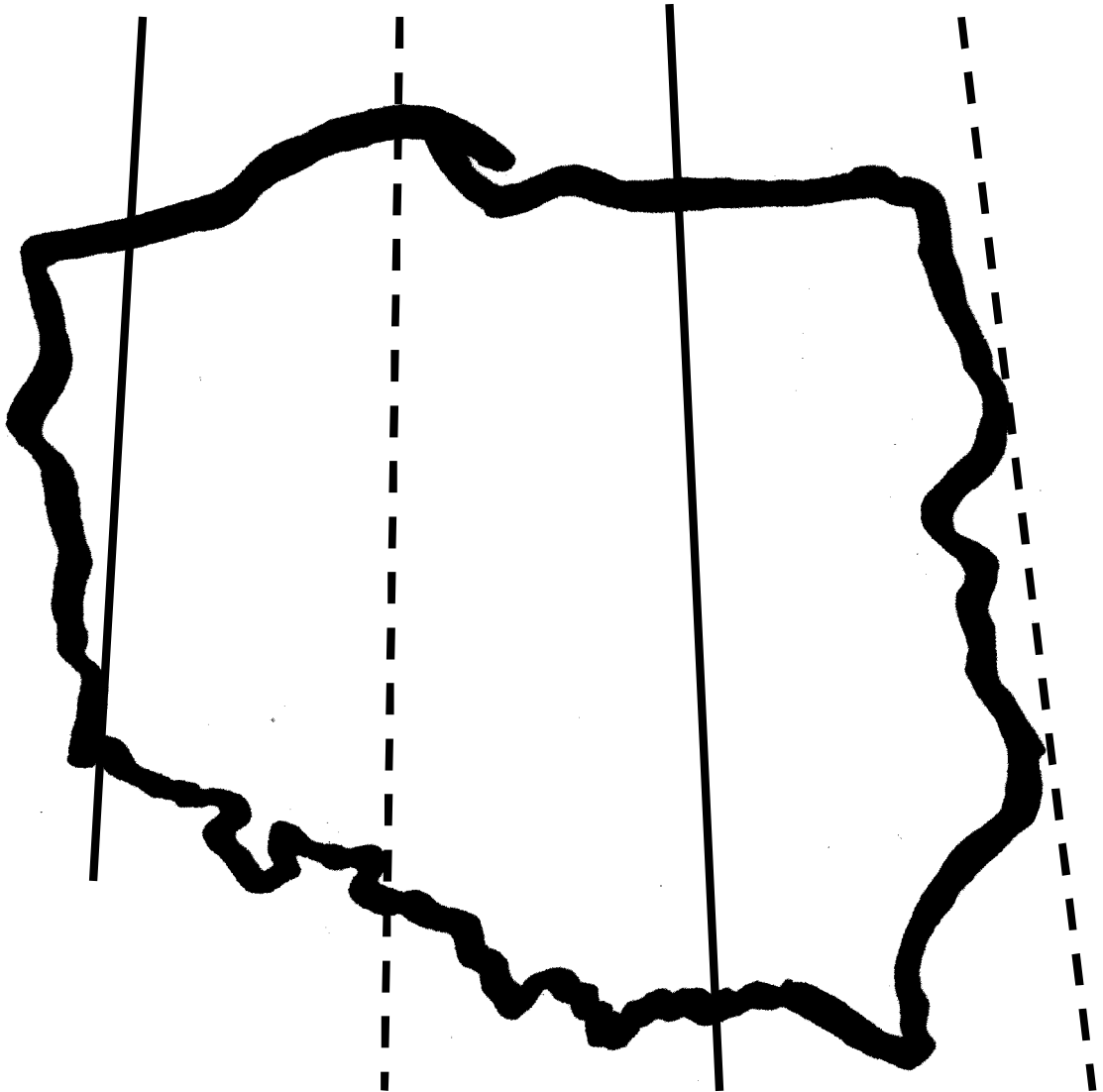




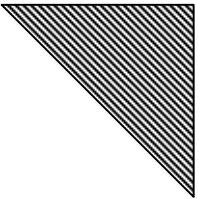
Braille text consisting of two rows of characters. The first row contains several groups of dots, with two groups enclosed in square boxes. The second row contains more Braille characters.

Braille characters: ⠠⠠⠠⠠⠠⠠

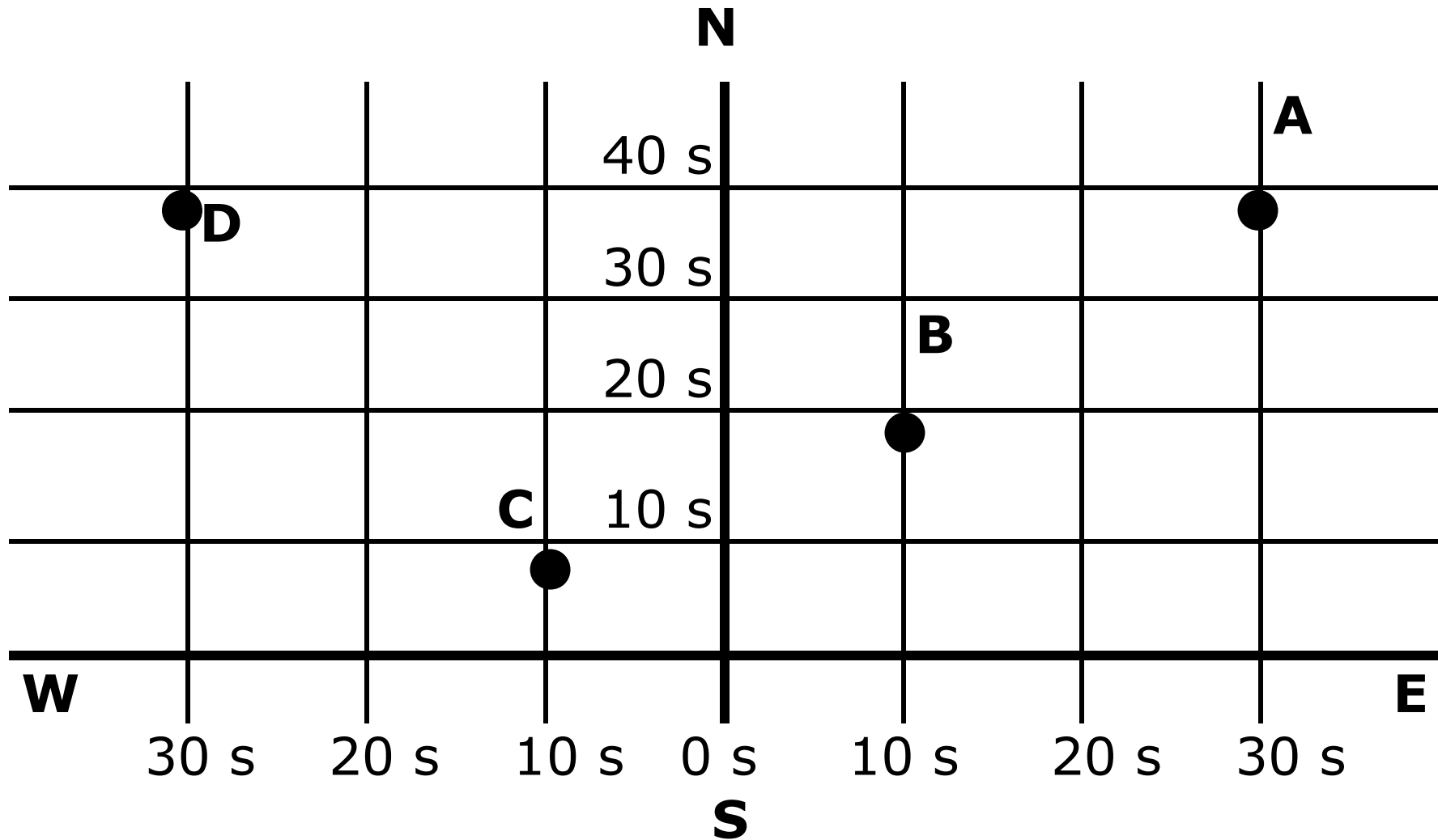
Braille characters: ⠠⠠⠠⠠⠠⠠





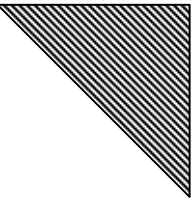


# Czytanie współrzędnych geograficznych

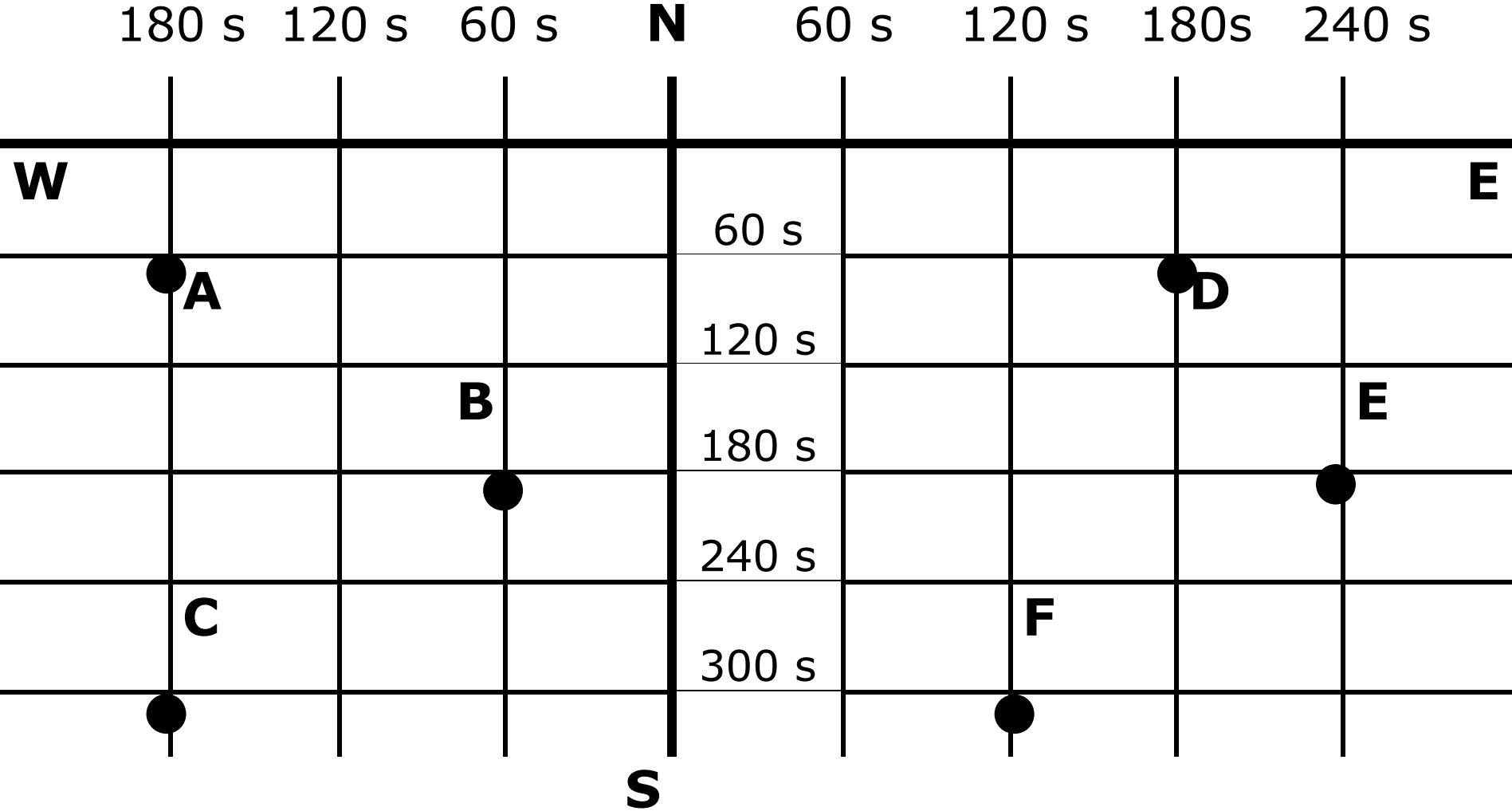


**s - stopnie**



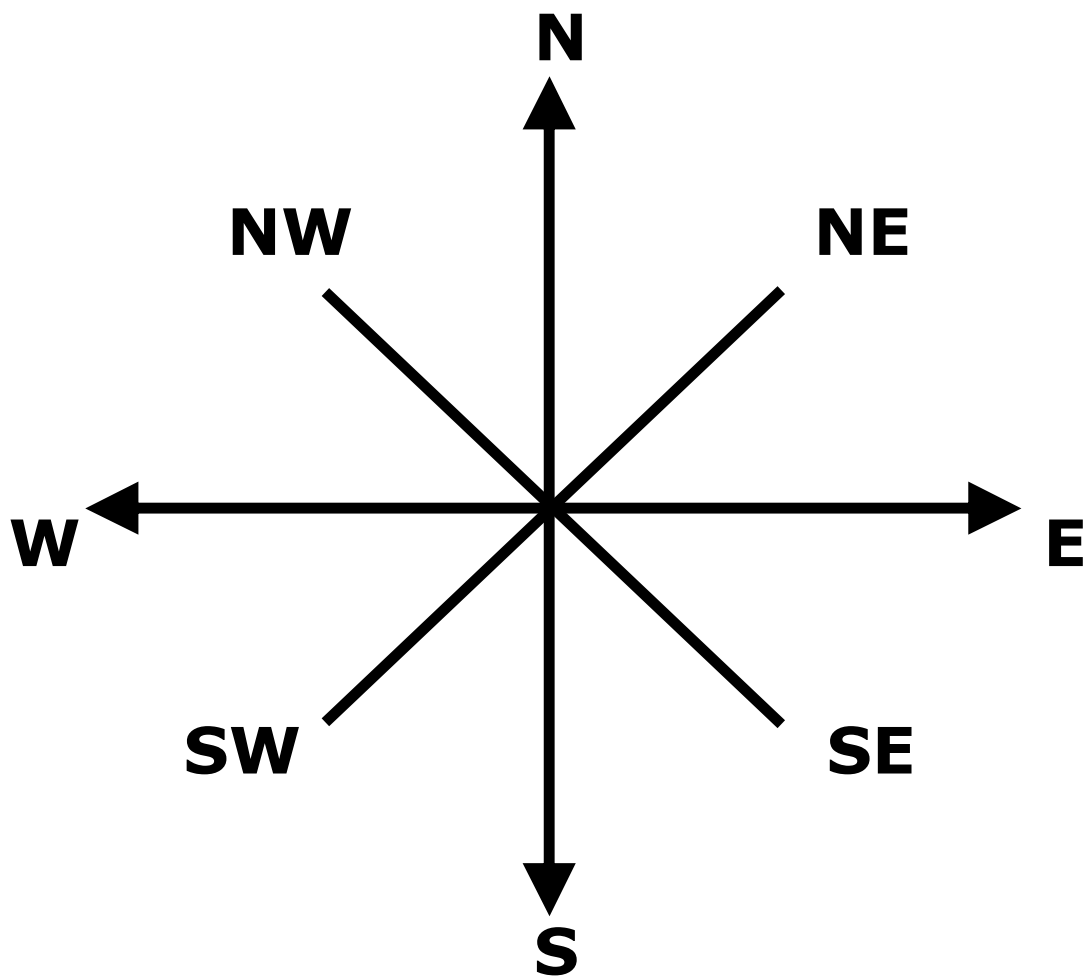


# Czytanie współrzędnych geograficznych





# Kierunki świata



**N (North) – północ**

**S (South) – południe**

**E (East) – wschód**

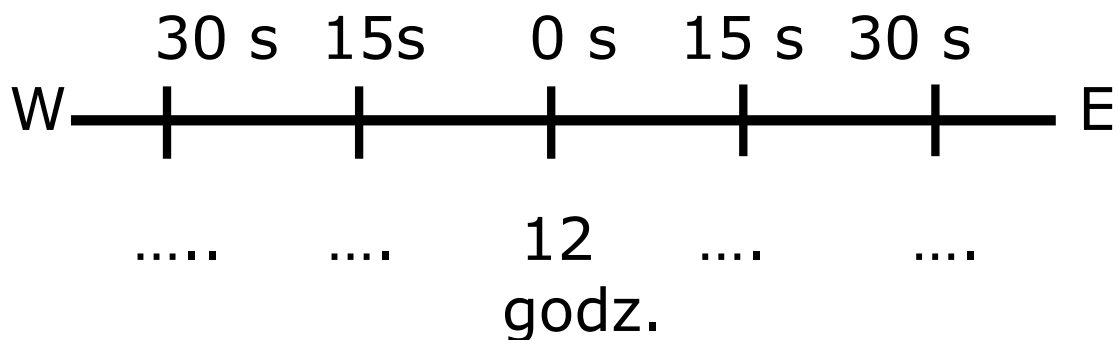
**W (West) – zachód**

# Obliczanie czasu słonecznego

Pamiętaj: 360 stopni – 24 h  
15 stopni – 1 h  
1 stopień – 4 min

Zad. 1

Oblicz, która godzina czasu słonecznego jest na podanych południkach, wiedząc, że na południku 0 stopni jest południe słoneczne.



s - stopnie

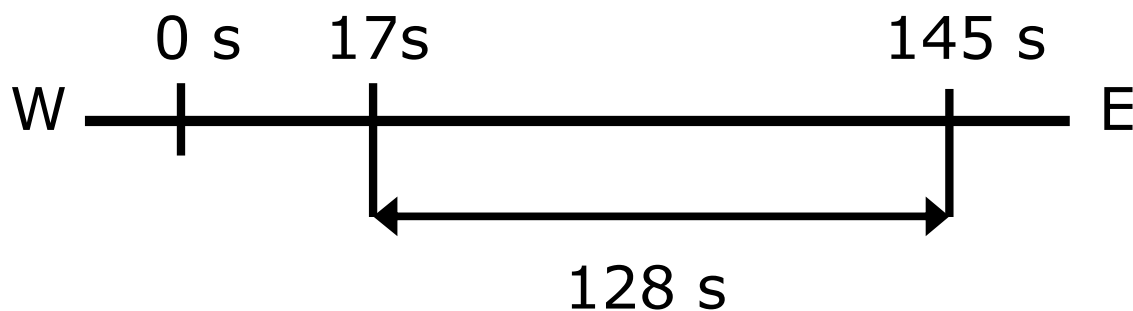


# Obliczanie czasu słonecznego

Pamiętaj: 360 stopni – 24 h  
15 stopni – 1 h  
1 stopień – 4 min

Zad. 2

Oblicz godzinę czasu słonecznego w Melbourne (145 stopni E), jeśli w Słupsku (17 stopni E) jest południe słoneczne.



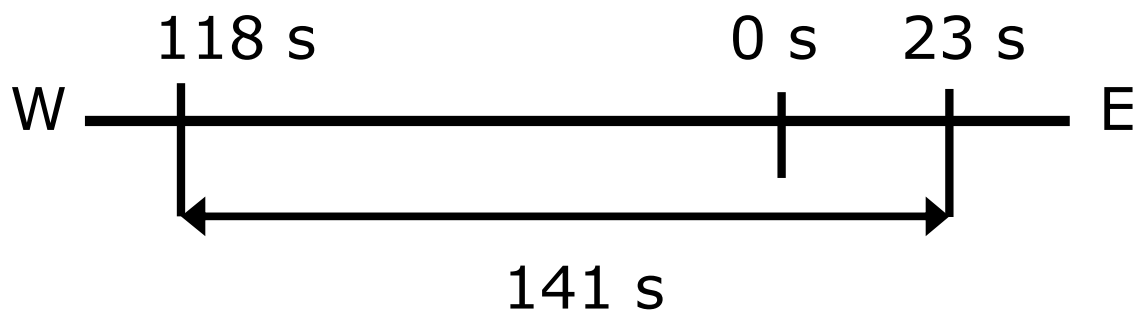
s - stopnie

# Obliczanie czasu słonecznego

Pamiętaj: 360 stopni – 24 h  
15 stopni – 1 h  
1 stopień – 4 min

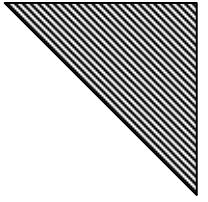
Zad. 3

Oblicz godzinę czasu słonecznego w Los Angeles (118 stopni W), jeśli w Augustowie (23 stopni E) jest godzina 16.

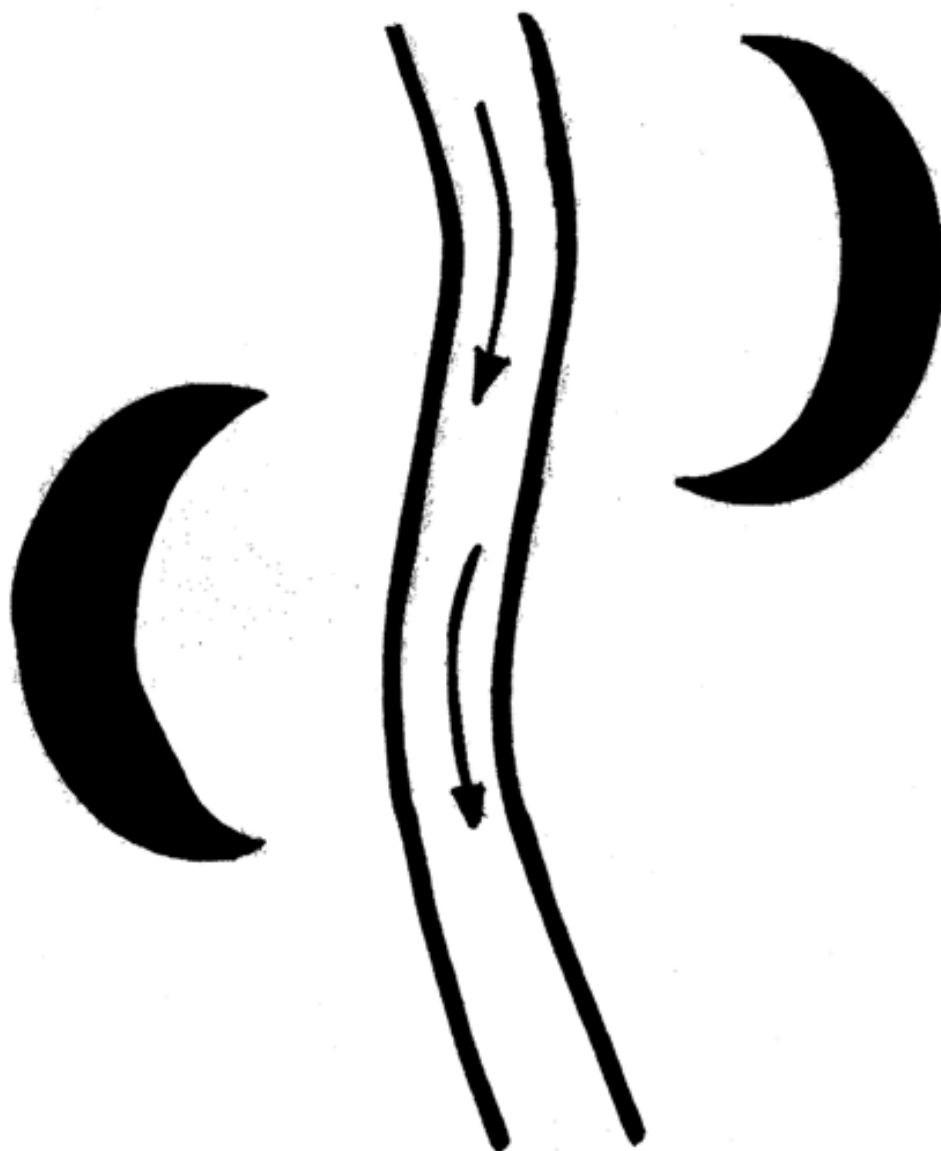
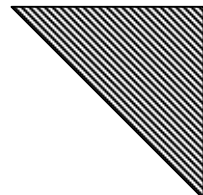


s - stopnie

# Meander



# Starorzecza



# Współrzędne geograficzne Polski



# Podział administracyjny Polski

