

Indywidualny identyfikator uczestnika konkursu

WOJEWÓDZKI KONKURS PRZEDMIOTOWY   
Z FIZYKI

organizowany przez Łódzkiego Kuratora Oświaty   
dla uczniów szkół podstawowych w roku szkolnym 2021/2022

TEST – ETAP SZKOLNY

* Na wypełnienie testu masz **60 min**.
* Arkusz liczy **12 stron** i zawiera **19 zadań,** w tym brudnopis.
* Przed rozpoczęciem pracy sprawdź, czy Twój arkusz jest kompletny. Jeżeli zauważysz usterki, zgłoś je Komisji Konkursowej.
* Zadania czytaj uważnie i ze zrozumieniem.
* Odpowiedzi wpisuj długopisem bądź piórem, kolorem czarnym lub niebieskim.
* Dbaj o czytelność pisma i precyzję odpowiedzi.
* W zadaniach zamkniętych zaznacz prawidłową odpowiedź, wstawiając znak X we właściwym miejscu.
* Jeżeli się pomylisz, błędne zaznaczenie otocz kółkiem i zaznacz znakiem X inną odpowiedź.
* Oceniane będą tylko te odpowiedzi, które umieścisz w miejscu do tego przeznaczonym.
* Do każdego numeru zadania podana jest maksymalna liczba punktów możliwa do uzyskania za prawidłową odpowiedź.
* Pracuj samodzielnie. Postaraj się udzielić odpowiedzi na wszystkie pytania.
* Nie używaj korektora. Jeśli pomylisz się w zadaniach otwartych, przekreśl błędną odpowiedź   
  i wpisz poprawną.
* Korzystaj tylko z przyborów i materiałów określonych w regulaminie konkursu.

***Powodzenia***

Maksymalna liczba punktów - 80

Liczba uzyskanych punktów - …..

Imię i nazwisko ucznia: …………………………………………..……………

wypełnia Komisja Konkursowa po zakończeniu sprawdzenia prac

Podpisy członków komisji sprawdzających prace:

1. ………………………………………………….. ……………….……………

(imię i nazwisko) (podpis)

1. ………………………………………………….. ……………….……………

(imię i nazwisko) (podpis)

# Zadanie nr 1

Zaznacz prawidłową odpowiedź. Wybierz zwierzę o najmniejszej masie:

1. koliber – 1,6 g
2. pszczoła - 0,0001 kg
3. mucha – 15 mg
4. komar – 0,026 dag

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(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 2

Z Polski do Afryki Środkowej jest 5500 km. Jaskółki potrafią latać z szybkością 30m/s. Oblicz, ile czasu potrzebuje jaskółka, by przed zimą dolecieć z Polski do Afryki Środkowej. Wynik zaokrąglij do pełnych godzin.

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(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 3

Wykres przedstawia zależność drogi od czasu dla trzech różnych zwierząt. Oblicz szybkość każdego zwierzęcia i wskaż to, które porusza się najszybciej.



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(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 4

Kot pokonuje 54 m ze stałą szybkością ½ m/s, a następnie biegnie wzdłuż tej samej prostej i taką samą odległość pokonuje z szybkością 3m/s. Oblicz średnią szybkość kota na całej drodze.

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**……………….../6 pkt.**

(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 5

Wykres przedstawia zależność szybkości od czasu dla dwóch rowerzystów I i II. W kolejnych zdaniach opisujących wykresy zaznacz P - jeśli zdanie jest prawdziwe lub F - jeśli jest fałszywe.

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| 1. W czasie pierwszych 4 s ruchu rowerzysta II przebył dwa razy większą drogę niż rowerzysta I. |  |  |
| P | F |
| 1. Szybkości rowerzystów zrównały się w końcu 4 s. | P | F |
| 1. Przyspieszenie rowerzysty I wynosiło 3m/s2, a rowerzysty II- 0 | P | F |
| 1. Na rowerzystę II działa stała siła, a na rowerzystę I – siła rosnąca w czasie |  |  |
| P | F |

**……………….../4 pkt.**

(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 6

Odległość od wejściowych drzwi domu do furtki wynosi 90 m. Gdy Marcin idący z szybkością 0,5 m/s pojawił się przy furce, spod drzwi domu wystartował pies. Pies pokonywał każde 7 m w czasie 2 s i biegł w stronę Marcina. Oblicz prędkość względną Marcina i jego psa oraz czas biegu psa do spotkania z Marcinem.

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(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 7

Mężczyzna pcha poziomo ruchem jednostajnym skrzynkę z jabłkami o masie 30 kg. Współczynnik tarcia skrzynki o podłoże wynosi f=0,2.Narysuj, zachowując proporcje, siły działające na skrzynkę i nazwij je. Oblicz pracę, jaką wykonał mężczyzna przesuwając skrzynkę na odległość 1,5 m. Do obliczeń przyjmij g=10 m/s2.

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(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 8

Piłka do tenisa ziemnego została puszczona swobodnie z wysokości 5 m nad powierzchnią ziemi. Oblicz szybkość, z jaką piłka uderzy o ziemię. Pomiń opory ruchu. Do obliczeń przyjmij przyspieszenie ziemskie g=10 m/s2.

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(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 9

Moc lecącej muchy wynosi 3 .10-4W. Oblicz pracę, jaką wykona mucha w czasie 2 min. lotu.

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(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 10

Wykres przedstawia zależność objętości V od masy m dla 4 różnych substancji.

Wskaż substancję o największej gęstości.

1. A
2. B
3. C
4. D

**……………….../1 pkt.**

(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 11

Jednakowej wielkości sześcienne klocki z sosny (1), klonu (2) i dębu (3) wrzucono do wody. Gęstość drewna sosnowego wynosi 500 kg/m3, klonu -750 kg/m3 a dębu – 900 kg/m3. Ustal, z którego drewna są klocki nadając im przypisane cyfry 1, 2 lub 3.



**……………….../2 pkt.**

(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 12

Rysunek przedstawia dźwignię, w której nie można zmienić położenia szalek. Oblicz masę dodatkowego obciążnika, który należy dołożyć do jednej z szalek aby zrównoważyć dźwignię. Wskaż szalkę, do której należy dołożyć ten dodatkowy obciążnik.

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(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 13

Nasienie klonu spada wykonując 8 obrotów w czasie 2 sekund. Oblicz okres obrotu nasienia klonu.

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(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 14

Uczeń wykonał następujące doświadczenie: Talerz do zupy napełnił wodą. Następnie na powierzchni wody ostrożnie położył igłę krawiecką. Zaobserwował, że igła pływa po powierzchni wody mimo iż gęstość stali jest większa od gęstości wody. Wskaż zjawisko, które jest przyczyną takiego zachowania się igły.

1. dyfuzja
2. menisk
3. tarcie
4. napięcie powierzchniowe

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(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 15

Do menzurki wlano 200 g wrzącej wody. Oblicz, ile energii odda woda stygnąc do temperatury 20oC. Przyjmij ciepło właściwe wody 4200 .

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(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 16

Pewien młody, ciekawy świata człowiek zagotował 1 litr wody. Wrzącą wodę wlał do ogrzanego, szklanego naczynia i włożył do wody termometr. Co pół godziny odczytywał pomiary temperatury wody. Wyniki zaznaczał na papierze milimetrowym.

Na podstawie wyników przedstawionych na wykresie uzupełnij zdania wpisując prawidłowe wyrażenie spośród podanych w nawiasie, wpisz dane liczbowe oraz uzasadnienie:

Przy każdym następnym pomiarze temperatura wody była (niższa, wyższa) ………… niż przy poprzednim. Wraz z upływem czasu szybkość stygnięcia wody (maleje, nie zmienia się, rośnie) ...…………… . Woda, gdy stygnie (oddaje, pobiera) ……………. ciepło (z, do) ………. otoczenia.

Średnią szybkość ostygania wody możemy obliczyć dzieląc zmianę temperatury wody przez czas, w jakim ta zmiana nastąpiła. Średnia szybkość ostygania wody w pierwszej godzinie wynosiła ……… oC/h, a w siódmej godzinie …….. oC/h. Po siedmiu godzinach temperatura wody nie zmienia się, ponieważ woda ……………………………………………………………………………………………………………………………………………………………………………………………………

**……………….../7 pkt.**

(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 17

Cylinder miarowy o wysokości 30 cm jest całkowicie wypełniony dwiema cieczami – wodą i olejem. Wysokość słupa wody wynosi 10 cm. Oblicz ciśnienie hydrostatyczne wywierane przez ciecze na dno cylindra. Do obliczeń przyjmij gęstość wody 1000kg/m3, gęstość oleju 850 kg/m3, przyspieszenie ziemskie 10 m/s2.

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(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 18

Ciężar pewnego ciała zanurzonego w wodzie jest 2 razy mniejszy od ciężaru tego ciała w powietrzu. Oblicz gęstość tego ciała. Do obliczeń przyjmij gęstość wody dw=1000 kg/m3.

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(Ilość uzyskanych punktów / maksymalna ilość punktów)

# Zadanie nr 19

Dwa baloniki naelektryzowano ujemnie jednakowymi ładunkami i zawieszono na nitkach zaczepionych w jednym punkcie. Nitki rozsunęły się wskutek odpychania się ładunków zgromadzonych na balonikach.

Zaznacz na rysunku znaki ładunków na balonikach i na płycie. Opisz, w jaki sposób zachowają się baloniki po wstawieniu między nie metalowej uziemionej płyty.

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Podaj nazwę zjawiska, które odpowiada za zachowanie się baloników po wstawieniu między nie płyty.

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**……………….../3 pkt.**

(Ilość uzyskanych punktów / maksymalna ilość punktów)

Brudnopis

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