



# Симметрия окружающего мира

# Симметрия в живой природе

В природе с помощью математики красота не создается, как в технике и в искусстве, а лишь фиксируется, выражается.

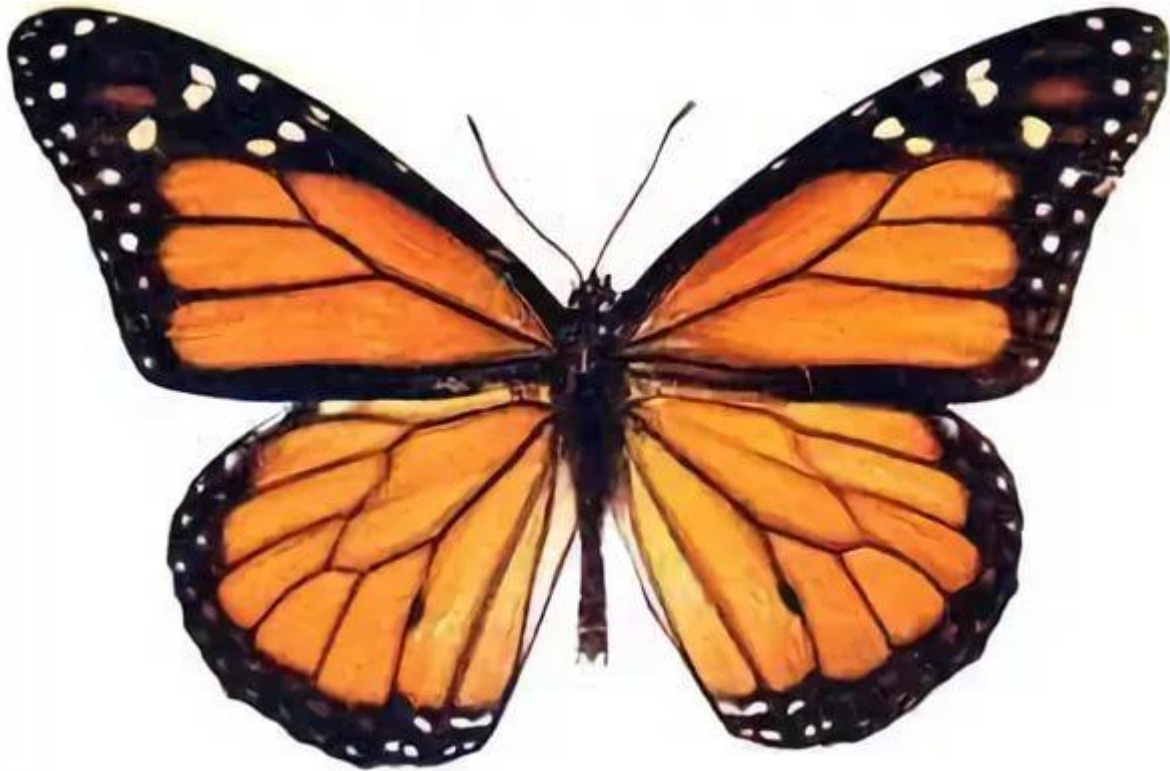


Осевая симметрия



Центральная симметрия

# Симметрия в живой природе



# Симметрия в неживой природе



Кристаллы блещут симметрией.  
Е.С. Федоров



# Где мы взяли картинки

## бабочка 1

[https://yandex.ru/images/search?p=1&text=%D1%81%D0%B8%D0%BC%D0%BC%D0%B5%D1%82%D1%80%D0%B8%D1%8F%20%D0%BE%D1%81%D0%B5%D0%B2%D0%B0%D1%8F%20%D0%B2%20%D0%BF%D1%80%D0%B8%D1%80%D0%BE%D0%B4%D0%B5%20%D0%BA%D0%B0%D1%80%D1%82%D0%B8%D0%BD%D0%BA%D0%B8&img\\_url=http%3A%2F%2Ffb.ru%2Fmisc%2Fi%2Fgallery%2F3530%2F4213.jpg&pos=107&rpt=simage&lr=47](https://yandex.ru/images/search?p=1&text=%D1%81%D0%B8%D0%BC%D0%BC%D0%B5%D1%82%D1%80%D0%B8%D1%8F%20%D0%BE%D1%81%D0%B5%D0%B2%D0%B0%D1%8F%20%D0%B2%20%D0%BF%D1%80%D0%B8%D1%80%D0%BE%D0%B4%D0%B5%20%D0%BA%D0%B0%D1%80%D1%82%D0%B8%D0%BD%D0%BA%D0%B8&img_url=http%3A%2F%2Ffb.ru%2Fmisc%2Fi%2Fgallery%2F3530%2F4213.jpg&pos=107&rpt=simage&lr=47)

## бабочка 2

[https://yandex.ru/images/search?p=3&text=%D1%81%D0%B8%D0%BC%D0%BC%D0%B5%D1%82%D1%80%D0%B8%D1%8F%20%D0%BE%D1%81%D0%B5%D0%B2%D0%B0%D1%8F%20%D0%B2%20%D0%BF%D1%80%D0%B8%D1%80%D0%BE%D0%B4%D0%B5%20%D0%BA%D0%B0%D1%80%D1%82%D0%B8%D0%BD%D0%BA%D0%B8&img\\_url=https%3A%2F%2Freadtiger.com%2Fimg%2Fwkp%2Fru%2FBolboreta\\_98.jpg&pos=176&rpt=simage&lr=47](https://yandex.ru/images/search?p=3&text=%D1%81%D0%B8%D0%BC%D0%BC%D0%B5%D1%82%D1%80%D0%B8%D1%8F%20%D0%BE%D1%81%D0%B5%D0%B2%D0%B0%D1%8F%20%D0%B2%20%D0%BF%D1%80%D0%B8%D1%80%D0%BE%D0%B4%D0%B5%20%D0%BA%D0%B0%D1%80%D1%82%D0%B8%D0%BD%D0%BA%D0%B8&img_url=https%3A%2F%2Freadtiger.com%2Fimg%2Fwkp%2Fru%2FBolboreta_98.jpg&pos=176&rpt=simage&lr=47)

## лист клена

[https://yandex.ru/images/search?p=3&text=%D1%81%D0%B8%D0%BC%D0%BC%D0%B5%D1%82%D1%80%D0%B8%D1%8F%20%D0%BE%D1%81%D0%B5%D0%B2%D0%B0%D1%8F%20%D0%B2%20%D0%BF%D1%80%D0%B8%D1%80%D0%BE%D0%B4%D0%B5%20%D0%BA%D0%B0%D1%80%D1%82%D0%B8%D0%BD%D0%BA%D0%B8&img\\_url=https%3A%2F%2Fds04.infourok.ru%2Fuploads%2Fex%2F0002%2F00030d41-66f7870e%2Fhello\\_html\\_m6aa3c32d.jpg&pos=205&rpt=simage&lr=47](https://yandex.ru/images/search?p=3&text=%D1%81%D0%B8%D0%BC%D0%BC%D0%B5%D1%82%D1%80%D0%B8%D1%8F%20%D0%BE%D1%81%D0%B5%D0%B2%D0%B0%D1%8F%20%D0%B2%20%D0%BF%D1%80%D0%B8%D1%80%D0%BE%D0%B4%D0%B5%20%D0%BA%D0%B0%D1%80%D1%82%D0%B8%D0%BD%D0%BA%D0%B8&img_url=https%3A%2F%2Fds04.infourok.ru%2Fuploads%2Fex%2F0002%2F00030d41-66f7870e%2Fhello_html_m6aa3c32d.jpg&pos=205&rpt=simage&lr=47)

## рога

[https://yandex.ru/images/search?p=6&text=%D1%81%D0%B8%D0%BC%D0%BC%D0%B5%D1%82%D1%80%D0%B8%D1%8F%20%D0%BE%D1%81%D0%B5%D0%B2%D0%B0%D1%8F%20%D0%B2%20%D0%BF%D1%80%D0%B8%D1%80%D0%BE%D0%B4%D0%B5%20%D0%BA%D0%B0%D1%80%D1%82%D0%B8%D0%BD%D0%BA%D0%B8&img\\_url=https%3A%2F%2Ffs1.ppt4web.ru%2Fimages%2F95377%2F141380%2F310%2Fimg10.jpg&pos=330&rpt=simage&lr=47](https://yandex.ru/images/search?p=6&text=%D1%81%D0%B8%D0%BC%D0%BC%D0%B5%D1%82%D1%80%D0%B8%D1%8F%20%D0%BE%D1%81%D0%B5%D0%B2%D0%B0%D1%8F%20%D0%B2%20%D0%BF%D1%80%D0%B8%D1%80%D0%BE%D0%B4%D0%B5%20%D0%BA%D0%B0%D1%80%D1%82%D0%B8%D0%BD%D0%BA%D0%B8&img_url=https%3A%2F%2Ffs1.ppt4web.ru%2Fimages%2F95377%2F141380%2F310%2Fimg10.jpg&pos=330&rpt=simage&lr=47)

## цветок 1

[https://yandex.ru/images/search?text=%D1%86%D0%B5%D0%BD%D1%82%D1%80%D0%B0%D0%BB%D1%8C%D0%BD%D0%B0%D1%8F%20%D1%81%D0%B8%D0%BC%D0%BC%D0%B5%D1%82%D1%80%D0%B8%D1%8F%20%D0%B2%20%D0%BF%D1%80%D0%B8%D1%80%D0%BE%D0%B4%D0%B5%20%D0%BA%D0%B0%D1%80%D1%82%D0%B8%D0%BD%D0%BA%D0%B8&noreask=1&img\\_url=https%3A%2F%2Fds03.infourok.ru%2Fuploads%2Fex%2F0b1a%2F00066031-e4ff8bd9%2Fimg31.jpg&pos=6&rpt=simage&lr=47](https://yandex.ru/images/search?text=%D1%86%D0%B5%D0%BD%D1%82%D1%80%D0%B0%D0%BB%D1%8C%D0%BD%D0%B0%D1%8F%20%D1%81%D0%B8%D0%BC%D0%BC%D0%B5%D1%82%D1%80%D0%B8%D1%8F%20%D0%B2%20%D0%BF%D1%80%D0%B8%D1%80%D0%BE%D0%B4%D0%B5%20%D0%BA%D0%B0%D1%80%D1%82%D0%B8%D0%BD%D0%BA%D0%B8&noreask=1&img_url=https%3A%2F%2Fds03.infourok.ru%2Fuploads%2Fex%2F0b1a%2F00066031-e4ff8bd9%2Fimg31.jpg&pos=6&rpt=simage&lr=47)

## кактус

[https://yandex.ru/images/search?text=%D1%86%D0%B5%D0%BD%D1%82%D1%80%D0%B0%D0%BB%D1%8C%D0%BD%D0%B0%D1%8F%20%D1%81%D0%B8%D0%BC%D0%BC%D0%B5%D1%82%D1%80%D0%B8%D1%8F%20%D0%B2%20%D0%BF%D1%80%D0%B8%D1%80%D0%BE%D0%B4%D0%B5%20%D0%BA%D0%B0%D1%80%D1%82%D0%B8%D0%BD%D0%BA%D0%B8&noreask=1&img\\_url=https%3A%2F%2Fppt4web.ru%2Fimages%2F1563%2F44911%2F640%2Fimg7.jpg&pos=4&rpt=simage&lr=47](https://yandex.ru/images/search?text=%D1%86%D0%B5%D0%BD%D1%82%D1%80%D0%B0%D0%BB%D1%8C%D0%BD%D0%B0%D1%8F%20%D1%81%D0%B8%D0%BC%D0%BC%D0%B5%D1%82%D1%80%D0%B8%D1%8F%20%D0%B2%20%D0%BF%D1%80%D0%B8%D1%80%D0%BE%D0%B4%D0%B5%20%D0%BA%D0%B0%D1%80%D1%82%D0%B8%D0%BD%D0%BA%D0%B8&noreask=1&img_url=https%3A%2F%2Fppt4web.ru%2Fimages%2F1563%2F44911%2F640%2Fimg7.jpg&pos=4&rpt=simage&lr=47)

## апельсин

[https://yandex.ru/images/search?text=%D1%86%D0%B5%D0%BD%D1%82%D1%80%D0%B0%D0%BB%D1%8C%D0%BD%D0%B0%D1%8F%20%D1%81%D0%B8%D0%BC%D0%BC%D0%B5%D1%82%D1%80%D0%B8%D1%8F%20%D0%B2%20%D0%BF%D1%80%D0%B8%D1%80%D0%BE%D0%B4%D0%B5%20%D0%BA%D0%B0%D1%80%D1%82%D0%B8%D0%BD%D0%BA%D0%B8&noreask=1&img\\_url=https%3A%2F%2Fds03.infourok.ru%2Fuploads%2Fex%2F06cc%2F0001665b-bf933859%2F640%2Fimg56.jpg&pos=44&rpt=simage&lr=47](https://yandex.ru/images/search?text=%D1%86%D0%B5%D0%BD%D1%82%D1%80%D0%B0%D0%BB%D1%8C%D0%BD%D0%B0%D1%8F%20%D1%81%D0%B8%D0%BC%D0%BC%D0%B5%D1%82%D1%80%D0%B8%D1%8F%20%D0%B2%20%D0%BF%D1%80%D0%B8%D1%80%D0%BE%D0%B4%D0%B5%20%D0%BA%D0%B0%D1%80%D1%82%D0%B8%D0%BD%D0%BA%D0%B8&noreask=1&img_url=https%3A%2F%2Fds03.infourok.ru%2Fuploads%2Fex%2F06cc%2F0001665b-bf933859%2F640%2Fimg56.jpg&pos=44&rpt=simage&lr=47)

## Снежинки

<https://yandex.ru/images/search?p=1&text=%D1%81%D0%BD%D0%B5%D0%B6%D0%B8%D0%BD%D0%BA%D0%B8&noreask=1&lr=47>